

# **WORD FOR WORD**

Word Perfect 5 v Sprint

# **PUBLIC DOMAIN**

Low-cost software for all

# **VIDEO BUFFERS**

Control your screen output

# **C PROGRAMMING**

Loop and define explained

# **WORD PROCESSORS**

11 packages compared

# **SCANNING**

Adding graphics to DTP

# **REVIEWS**

- A.C.T.
- Library
- Sentinel
- SongWrightCherry Dragon
- Money Manager
- Brother PC and AT

# The leader in disks and data storage presents new products

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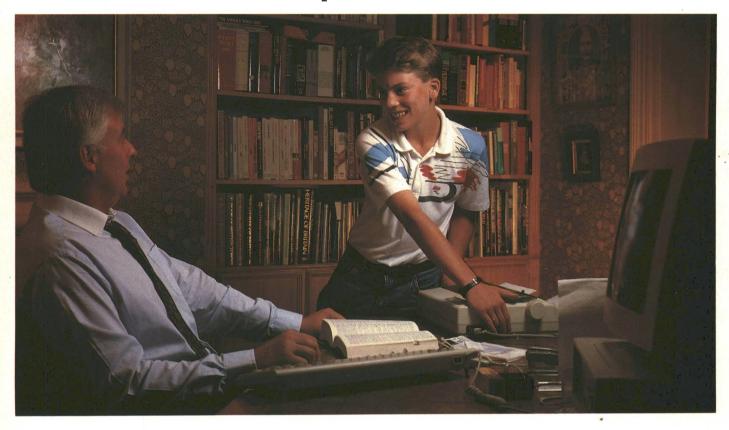
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# The day Daniel's dad brought his office printer home.



My dad's firm is always busy so he has lots of LC-10 printers at his office.

In fact, he sometimes has so much work to do that he keeps a personal computer in his study so he can bring work home.

But when he's really busy, he brings home one of those Star printers too.

Of course, I know exactly how to use them because we have the colour version at school.

It can print documents in six different colours.

So I'm not surprised WHAT MICRO? called the LC-10 the 'Best Budget Dot Matrix Printer' on the market.

What's more it's a lot less expensive than other printers but much better quality.

(My friend, Philip, even has one for his Commodore.) For a start the front control panel is child's play.

The six different fonts give you so many different style options when you print things.

It's pretty fast too with a draft elite speed of 144 cps and high density near letter quality at 36 cps.

There's also the LC-10's special feature called 'push-tractor' which gives the lowest tear-off position of the paper.

And you can park continuous paper and automatically load single sheets – and I think that's unique for this sort of printer.

You know, if I keep my paper round going for a few more weeks I'll soon have enough to buy my own LC-10.

And then for a small fee, dad can borrow mine.





Star Micronics U.K. Ltd. Craven House, 40 Uxbridge Road, Ealing, London W5 2BS. Telephone: 01-840 1800.

A division of Star Micronics Co., Ltd., Japan.

	ails of the Star LC-10 business p	
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Postcode	Telephone	
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2 No. 11 March 1989

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# News

News editor Mike Cowley and his team have been looking into the impact which the EEC's levy on Japanese printers will have on the man in the street. Plus full coverage of the rest of the news.

# Word processing

After reviewing Word Perfect version 5 and Borland's Sprint separately, we now provide a comparison test. Francis Botto has been delving into the depths of both programs.

# Video control

John Whiting shows how to access, amend and adjust the areas of memory used by your PC's screen drivers. All you need is the simplest of tools such as the free MSdos utility Debug.

# **Money Manager**

Book-keeping on a budget can be easily achieved using your PC and some suitable software. Tim Woodward finds this program from Connect gives a really good account of itself.

# Voice-Scribe 128

For the physically handicapped, the ability to control a PC by voice means the difference between being able to operate a computer or not. The latest product from America's Cherry Corporation enables you to do just that - reports Peter Hartley.

# **Gem Jottings**

Mike James examines some of the equipment that you'll need to incorporate freehand drawings or photographs into DTP and graphics applications.

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As Commodore launches its assault on the PC market, Ken Hughes talks to UK managing director Steve Franklin about his future plans and aspirations.

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A virus in computer terminology can mean a lot more than two days off work while you recover. Roman Iwaschkin reviews a program which will make a visit to the disc doctor unnecessary.

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Brother's new PCs - XT and AT clones - are top quality machines at competitive prices. Ian Sharpe reports in detail on the BC-10 and BC-20.



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In the third part of his series on programming in C, Ian Sharpe explains the loops available and how to use them. He also looks at defines and the way you can redirect the destination of a file.

PERSONAL COMPUTING WITH THE AMSTRAD

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Concluding his tutorial on desktop design and draughting, Harry Atherton reflects on the way technology has grown — and forecasts quite a few major changes in the future.

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The disc operating system on the PC is well known to be a hostile environment for the user. But salvation is at hand for little cost — if you know where to look. Don Bradbury explains.

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After word processors come music processors. Our Midi maestro, Ian Waugh, plays composer while the notable software from Computer Music Systems keeps the score.

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Activity control technology embodies the art of knowing where you are supposed to be — or where you have been — at any particular time. This software keeps track of your movements, as Tony Kendle found out.

# **Digitisers**

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With desktop publishing becoming more popular and word processors much more sophisticated, ways of getting pictures into your PC are needed. Steve Mansfield investigates two such systems from The Electric Studio and Rombo Productions.

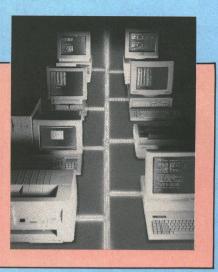


PERSONAL COMPUTING WITH THE AMSTRAD

# **Sharing resources**

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Ian Sharpe looks at two products – the American \$25 network and Britain's SLinky. The former allows two or more PCs to be linked by their serial ports, while the latter provides facilities for printer sharing. Together they could mean low-cost, efficient networking for all.



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# Library

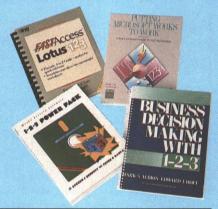
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In a new service for *PC* readers, each month we will present a selection of products for comparison. This month we contrast 11 word processors.

As we approach our second birthday we invite you to tell us what you think about your magazine. Fill in the form and return it to us and you could win one of 50 prizes.

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In this month's letters pages, we explain how to be colourful in your Basic and C programming, how to make Microsoft Works operate on one disc and how to make your own printer stand.

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119

Our packed cover disc has a working demonstration of a database generator, a cut-down version of Ology's Cribbage, Diary – a pop-up calendar and note book – plus two handy utilities.



March 1989 5



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# Yes, there is a problem with PC 2086 - Amstrad

AMSTRAD has done a complete about turn and admitted that it has a major problem with its PC2086 machine, the entry level model of its 2000 series.

In last month's PC, the company issued a denial that there was a major manufacturing problem with the machine's hard disc

This followed an exclusive PC interview with a Midlands dealer - Bhasha Modeshia of Admincure - in which she revealed she'd had to send her entire stock of PC2086s back to Amstrad because of malfunctioning hard discs.

When this was brought to Amstrad's attention, a company spokesman totally refuted the allegation. However in a subsequent technical bulletin sent to dealers, Amstrad has been forced to admit that a serious problem does exist with the PC2086 hard disc.

This identifies that the fault lies in a missing capacitor and not missing chips as had originally been suggested to us by Bhasha Modeshia. The text of the bulletin, "PC2086/30 hard disc controller errors", reads.

We have identified a fault on the hard disc controller used in the PC2086/30 computer. When this fault occurs, data read or write errors may be experienced when using the hard disc drive.

To solve the problem, a 560pF ceramic disc drive capacitor must be added between pin 44 of IC707 and ground. A suitable ground point is the ground side of

N.B. If the PC2086/30 has been returned from a customer who has experienced this fault the hard disc must be reformatted. The reason for this is that the fault could have corrupted the File Allocation Table. It should be reformatted (using the Dos command "FORMAT C:/S") in all reported instances. However, the customer should be warned that all data on the hard disc will be lost.

# SHORT **REPORTS**

A TALKING PC phone dialler has been launched by Aldoda International (01-586 5686). Called PC Phone, the half-card with loudspeaker and special memory-resident software costs £229.

JAPANESE manufacturer NEC has begun marketing neural computers for highly sophisticated data processing based on neurons and the neural network of the human brain.

WEST German PC maker Rein Electronic has unveiled its 450 SLC laptop featuring 16MHz 80286 processor, 1Mb of memory, single 1.44Mb floppy disc and internal 40Mb hard disc. It includes parallel and serial ports as standard and costs about £4,000.

WHAT is believed to be the world's smallest MSdos laptop has been introduced by Tokyo firm Microsystems. The 16-bit PS/2 Model 30compatible weighs only 2.5 kilograms and measures 198x200x47mm.

\* \* \*

AMI, a new windows-based word processor from Samna (01-587 1121) has a wysiwig screen display and style sheet formatting to speed up the creation of sophisticated business documents.

Price £99 during a limited introductory period. Later it will cost £195.

# Viglen's go faster XT models

A NEW upgrade now makes the VIG I one of the fastest IBM XT compatibles on the market says Viglen (01-843 9903).

Two versions are available the standard 12MHz model and one running at 15MHz. Both offer 640k of ram memory as standard, expandable to house up to 1Mb on the motherboard.

The system has a fast 30Mb Winchester hard disc, with a 360k 5.25in floppy drive or 720k 3.5in. The facility for both drives is available as an optional extra.

A standard VIG I comes with MSdos 3.30 and GW Basic, but



Viglen's IBM XT compatible VIG I

for another £49 Viglen will supply MSdos version 4.

The VIG I monochrome

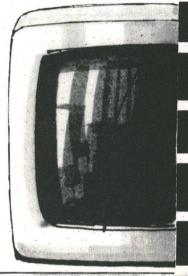
system costs £789, with EGA and VGA display versions also available.

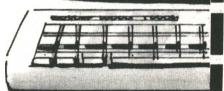
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# When you buy a whole new Amstrad system, why use only half of its potential?





A Message from Amstrad's Chairman . . . . .

Dear Amstrad Computer User,

You don't need me to remind you that you have selected the best computer in it's price range. Numerous journalists from the specialist press have now contributed to the opinion that Amstrad computers represent the best all-round machine you can buy.

One of the many reasons why computer journalists have received our products so enthusiastically is undoubtedly our careful attention to providing information on the system and it's software.

You can be a part of Amstrad's ongoing effort to inform and help users by taking advantage of this opportunity

- 12 Issues of the Official Amstrad PC Magazine. (Amstrad Professional Computing - worth £1.25 per month)
- Unlimited access to our PC Technical Support Service.
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to join the User Club. Catering only for the Amstrad computer user, this specialist support club was initially formed by Amstrad solely for the purpose of assisting you with all your computer needs.

There are many immediate and direct benefits available, so don't delay before filling out the application form below and sending it back to Amsoft.

Yours sincerely,

Alan Sugar Chairman AMSTRAD Plc



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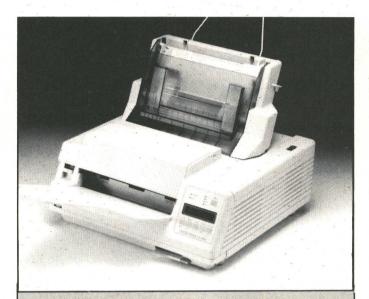
# Industry welcomes Euro Show

THE first European Computer Trade Show to be held at London's Business Design Centre from April 16 to 18 is already an assured success.

An update on the unique event reveals:

- More than 50 exhibitors confirmed including big names from the USA, Germany, Spain, Sweden and Switzerland.
- All the mezzanine floor stands at London's Business Design Centre now sold.
- 50,000 ticket registration forms on their way to leading industry names throughout Europe and the USA.
- Star studded speaker line-up for show seminars involving key industry figures from the USA, UK, France, Sweden, Greece, Switzerland, Italy and Holland.
- Major American trade presence expected. US personalities to include Larry Foster, the man who controls the purse strings of the world's largest retailer, Egghead Software, and Glen Ochsenreiter, director of Waldenbooks, the 500-strong store group.
- US Software Publishers Association to attend to seek out European opportunities for its 2,000 members.
- International network of 12 agents in place and promoting the show extensively throughout Europe and North America.

"The computer industry has reacted in the most positive way possible to this event – by voting with its feet", said Michael Meakin, head of organiser Database Exhibitions (0625 879970).



# The laser's successor?

LED technology will replace the laser as the desired letter quality office printer format within two years, according to Seikosha (0895 52131).

The firm has just released its lightweight, small footprint OP-105A – first of several it intends to launch on the British market later this year.

Priced at £1,700, it

operates at five pages a minute and has four built-in emulations — IBM Proprint, HP Laserjet, Epson FX and Diablo 630.

Seikosha UK general manager David Chadwick said: "Just as the laser has proved the natural successor to the daisywheel, I believe the LED printer will replace the laser".

# IBM graphics deal

IBM has signed an agreement to distribute graphics software from Micrografx, publisher of the award-winning Micrografx Designer, Graph Plus and Draw Plus. The products were chosen to complement SolutionPac, which is made up of IBM's PS/2, PostScript laser printer, MicroSoft Windows and Aldus Pagemaker.

# **COLLECTING CALLBOXES**

WINNERS of our September 1988 Callbox competition were N R Bentley, Longridge Road, London; Paul North, Rosehill Farm Meadow, Banstead; Mark Shelton, Bletchington, Oxford; J A Nurser, White Hart Lane, Fareham; Andrew Smith, Albert Road, Briscombe; D P Raphael, Gateshead Road, Borehamwood.

Each will receive the Callbox telephone manager system manufactured by Callbox Electronics & Communications of Monmouth, Gwent.

# New video processing system

AN image processing system for IBM PCs and compatibles has been launched by Eltime Vision (0621 59500). Image II is a plug-in card which accepts video input from a camera or VTR, digitises the picture in real

time and stores up to five pictures simultaneously at a resolution of 256x256 by 64 grey levels.

The price will be under £1,000 according to an Eltime spokesman.

# SHORT REPORTS

PRICE reductions on its CCM-104 colour monitor and PCG-1000 graphics display board have been announced by Citizen Europe (0895 72621). The CCM-104 now costs £640 and the PCG-1000 £380.

\* \* \*

A SURVEY of top moneymakers in the Sunday Times claims Amstrad boss Alan Sugar was one of the few UK millionaires to increase his fortune in 1988. Sugar is said to be worth £430 million compared to £283 million a year ago.

\* \* \*

REPORTS from the US say IBM is still struggling to get a laptop off the drawing board after problems with batteries and poor screen technology.

\* \* \*

THE system peripherals division of Millbank Computers (01-847 4151) is to distribute American product GoScript in the UK.

The software utility with 13 scaleable outline fonts gives full PostScript capability to laser, dot matrix and ink jet printers and costs £195. GoScript+with 35 fonts costs £395.

\* \* \*

AUTODESK's long-awaited 3D version of Autocad has arrived, and Computacenter (01-620 2222) is offering a bundled upgrade and customised training package.

Seminars on Autocad Release 10 will be held in London, Glasgow, Cardiff, Birmingham and Swindon between now and the end of March.



A TRADE war is currently raging between the European Economic Community and Japan. Caught in the middle are the Japanese manufacturers of bestselling dot matrix printers and the end users in both Europe and the UK.

Here Mike Cowley and Don Lewis investigate why PCA readers will soon be paying much more for the top quality machines.

ONE day earlier this month Malcolm Jamieson received two messages. One he'd been expecting the other he hadn't.

First was the good news by way of a phone call reporting that three container loads of Japanese printers ordered by his company had arrived at Tilbury Docks.

Then came the bad in the shape of a telex from Customs and Excise. This informed him that his company — Crown Computer Products of Burscough, Lancashire — had become a victim of a trade war between the EEC and Japan.

For it contained a directive that he would have to pay up to 40 per cent more for the printers he had brought in — and so will the end user — thanks to the boys from Brussels.

As such, it was the first sign that legislation — the effect of which will be to force the man in the street to pay substantially higher prices for top quality dot matrix printers — had begun to bite.

Crown Computer Products specialises in providing brand name peripherals at less than trade prices, with a sizeable part of its business involving Japanese printers.

However, his company finds itself caught up in a controversial ruling by the EEC that will ensure price rises of up to 40 per cent on machines which account for 80 per cent of all sales in the UK.

This is due to an antidumping levy imposed by the EEC on 15 leading Japanese manufacturers in what has been severely criticised as a

# Customers are trade war casualties

classic protectionist policy.

The companies concerned are held in a vice. They cannot try to defend their market share by absorbing the penalties in their profit margins because the EEC has ruled they must pass on the full amount to customers.

It was in May last year that provisional duties were announced on Japanese printers being brought into the community. Manufacturers had six months to object to the levy and definitive duties were imposed on November 25.

Market leader Epson was at first informed its levy would be 33.3 per cent. This was subsequently reduced to 25.7 per cent on appeal.

Other Japanese printer manufacturers to have levies imposed on them are — Alps Electrical (6.1%), Brother (35.1%), Citizen (37.4%), Copal (18.6%), Japanese Business



Printers wait...prices will rocket

Computer (6.4%), Juki Corporation (27.9%), Nakajima All Precision (12.0%), NEC Corporation (32.9%), Oki Electric Industry (8.1%), Seikosha (36.9%), Shinwa Digital (9.5%), Star Micronics (13.6%) and Tokyo Electric (4.8%).

Large distributors are now finding the levy filtering through to them.

Malcolm Ramsay of P and P said price increases had been

passed on, but added it had not yet had any noticeable effect on business.

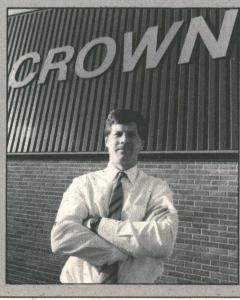
This legislation has also netted independent direct importers like Crown Computer Products who buy in bulk — often from abroad — then trim their profit margins down to the bone, relying on volume sales achieved through offering machines at substantial discounts

"What we are seeing here is a good old protectionist trade war between the EEC and Japan", says Malcolm Jamieson of Crown. "The people who will really suffer are those who buy from us. That means the trade, businesses of all sizes — and even the man in the street.

"As far as I am concerned if this is the sort of result we can expect from Britain's membership in the EEC it would seem we could well do without it"

How will this affect his business?

"It will mean that we will still be able to offer the lowest prices on the market — only these prices will now be higher", he said.



Malcolm Jamieson, managing director of Crown Computer Products, one company caught up in the printer trade war between the EC and Japan.



HOT on the heels of the swingeing import levies imposed on Japanese dot matrix printers comes news of a possible additional levy on imported Japanese components for assembly within the Community.

In the official journal of the EEC on December 20, 1988 it was announced that an investigation had been launched following complaints that certain companies were importing printer parts from Japan to assemble within the Community

Manufacturers have now received questionnaires which they are currently filling in with precise details on just how many components come from within the Community and how many from Japan.

They expect further levies later this year but no-one yet knows just how they will be imposed.

Epson makes three of its nine pin printers in Telford, two in Paris, and imports one top of the range model from Japan.

On the 24 pin range, one is made in Telford, two in Paris and — once again — the machine with the highest specifications comes from

All four models made at Telford have more than 40 per cent EEC generated parts (the figure stipulated at present by the EEC) and one is over 60 per

"When we get the component levy we will be bound by law to pass the increased cost on to our customers", said Epson's Tony Rastray. "We will have to put up prices. We cannot get out of that.

"We are hoping to offset price rises by achieving zero defect and just-in-time stocking in our factories and we hope to end up by manufacturing all our printers in the EEC".

Rosemary Gaski of Citizen Europe said the company had not been affected by last year's import levy as all its printers are manufactured in Scunthorpe, but it had to bring in 10 per

# Threat of a printer parts levy

cent increases in the summer because it was sourcing many of its components from Europe. This is more expensive than bringing them from Japan.

"We are going to try our hardest to source all our products in Europe to avoid the component levy", she added. "We already have local sourcing at 40 per cent, but we are hoping to stretch this to as much as 80 or 90 per cent.

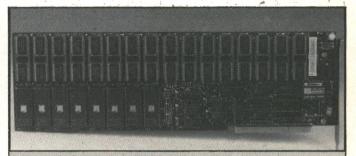
John Carter, national sales manager of Brother said it had pre-empted the import levy last year by opening a manufacturing plant in North Wales.

Optimistically, he added that with most of its models taking 50 to 60 pet cent of EEC components, he did not expect any problems from the new levy.

Distributors are also naturally concerned about the possible effects of a component levy.

"There has always been a fear of them putting a levy on components", said P and P's Malcolm Ramsay. "Larger manufacturers are saying this is going beyond the realms of possibility. If it starts with Japanese printers, it could go on to videos, washing machines, televisions and further.

"The first levy has meant that the major Japanese manufacturers have invested in plants in the UK. Further levies could well mean that they stop expanding and this could cause horrendous employment problems.



ADVANCED memory products innovator Micro Control Systems has launched a new solid state system it says is faster than bubble memory and more robust than mechanical disc drives

Called Silicon Disk, it is designed for use in network file servers, hazardous environments and in applications running large programs such as CAD/CAM.

"Because it operates at silicon speed it can achieve data transfer rates of up to 300,000cps, whereas bubble memory peaks at about 50,000cps and hard discs are even slower at about

# Silicon memory system

27,800cps", said Dr Richard Tavener of Micro Control Systems (0602 391204).

"This extra speed significantly cuts down data access and execution times, savings that are particularly noticeable when large programs like CAD/CAM are stored in silicon overlays alongside the hard disc".

Silicon Disk costs from £299.

# High flying winner

JOHN Loughlin, director of Roksan Engineering, Llandrindrod Wells, Powys will be jetting off to Paris after winning a competition for MicroLink subscribers.

Official Airlines Guide whose flight information, seat availability and hotel backup is one of MicroLink's most popular services — provided two tickets as part of a fact finding survey.

John, an Apricot 386 user,

said: "At Roksan we use Micro-Link mainly for its telex facilities, but we also find the system very useful for general business information.

"I will use the tickets either on one of my regular business trips to France or perhaps for a holiday there".

Susan Rowswell of OAG said she had been impressed by the number of MicroLink subscribers who responded to the questionnaire.

# Enter a maxi midget

THE 10in x 10in IBM XT compatible Micro Midget from ACPM (0227 770480) now has a bigger brother, the Micro Midget PC/XX. It has an 8088-1 10MHz processor, 640k ram, 102 keyboard and 720k 3.5in hard disc drive.

There is an internal 20Mb Conner 3.5in form factor drive, Sprint XT hard drive host adaptor card, serial and parallel ports, mono/hercules or switchable CGA video output, and it comes with a 12in monitor. Price £1,099.

An internal hard disc drive upgrade kit for existing machines is also available for





# Stockholm venue

DATA 89, the most important exhibition of PC hardware and software in Scandinavia, takes place from April 4 to 7 in Stockholm.

Around 40,000 people from all over Europe are expected to visit the show, held in two halls — one devoted to systems, the other to comms — at the Sollentuna Massan.

For further details you can call 010 468 767 2302.

# Comms controller

ON its way from Applied Knowledge (0422 330573) is AutoCom, a modem control package for PCs. "This is the most advanced modem control software available in the UK marketplace", said Applied Knowledge technical director Michael Faulks.

"It allows full network operations across PCs linked by modems without any special knowledge being required".

AutoCom permits access to Lotus, Word Perfect or dBase III files from another PC by simply entering a drive letter and typing the application name.

# What users seek in a hard card

FAST access times and ease of configuration and installation are the most important benefits users look for when upgrading a PC with a hard card.

Enhanced reliability with improved speed of backup and ease of use are the most important benefits of tape back up.

These are among the findings of a survey conducted by Ideal Hardware on the results of a competition in *PC*.

More than 800 readers entered by placing in order of priority a number of benefits of using a hard card and a tape backup device for mass storage and retrieval.

The survey indicated that speed, ease of use and low cost are more important to users than increased reliability due to the use of single component technology or lower power consumption requirements for

disc storage. It also showed that enhanced reliability, improved speed of back up and ease of use are more important to users than software features providing automatic backups, selective restore facilities and multiple backups on one tape.

Ideal Hardware managing director James Wickes said: "More and more users are now choosing hard cards rather than conventional fixed Winchester disc drives because they are easy to install and configure, and because they can offer similar performance capabilities".

The four first prize winners of a 60Mb Ideal Hard Card were R. W. Lyne, Harrogate; A Beston, West Bridgford; M Fereday, London; M. J. Breslin, Camden Town and R Brooke, New Ash Green. Other winners will be notified by post.

# NEW CONCEPT IN PC SUPPORT PACKAGES

A NEW style of support package for IBM PCs and compatibles has been launched by a leading UK systems house.

PC-Care allows subscribers to buy blocks of support units which can then be traded in for services ranging from training to consultancy/system analysis.

It comes from Burocare Computer Systems of Harrow, Middlesex, a company that has been involved in systems analysis, installations and support as well as research and development since 1981.

The PC-Care package covers:

- Training of staff to meet specific requirements.
- Telephone support for both software and hardware through a dedicated line to a

team of experts.

- On-site support from engineers who guarantee to get any system up and running with a minimum of disruption.
- Technical reports and software updates custom-written to meet a participating company's requirements, so ensuring a constant update source on changing technology.
- Consultancy/system analysis offering specialist advice on what is required for future computerisation of companies.
- Accidental damage and all risk insurance.
- Loss of data cover.

PC-Care involves buying support units in blocks of 20, with prices starting at £100 per block. Bulk buying reduces this.

# SHORT REPORTS

THE M.Ros midi realtime operating system for the IBM PC has been released by Steinberg.

The first multi-tasking operating system allowing simultaneous operation of various musical applications from one computer, it also allows networking between computers of different types.

M.Ros will be marketed in the UK through Evenlode Soundworks (099-389 8484).

\* \* \*

BEST known for its contribution to the Acorn Archimedes, Minerva Systems (0392 37756) is to enter the PC software marketplace with the Nova office organiser.

It will contain central and individual diaries, calendar with meetings scheduling, internal message transfer, access to electronic mail services, address book, notebook, calculator with conversion tables, reminders and alarms.

\* \* \*

A NEW preventive maintenance system for hard or floppy discs has been launched by Pecan Software (0272 425012). Called PC-CheckDisk, it runs a series of tests which detect changes in a disc. Price £49.

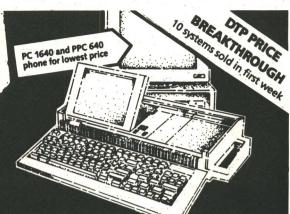
\* \* \*

A HARD disc IBM-compatible has been added to the Advent range of machines from Vision Technology (01-688 2654). It has an 80286 processor running at 12MHz with 0/1 wait states, 640k of ram expandable to 4Mb, 20Mb of hard disc storage and a 1.2Mb floppy drive. Price £995.

# A BENTALLY

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PRICES Because the Computing Marketplace is so volatile at present we have decided to stop publishing our prices until further notice (with certain 'special' exceptions). Please phone to check availability and prices which are: - TOO LOW TO PRINT!

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١	Finesse VI. 1£59
١	AMS Mouse£49
١	AMS Microscan£179 D.T.P. Solution 1£109
١	D.T.P. Solution 1£109
ı	D.T.P. Solution 2
۱	D.T.P. Solution 3£269
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Kuma Kroget	EA
Kuma Comm 2	CAL
Kuma Comm 2	621
Kuma Minstrel	.E2
Stockmarket	.EZ
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Amstrad PC1512 DD Mono
Amstrad PC1512 SD Colour
Amstrad PC1512 DD Colour
PC1512 Range includes Ability and
Four U.S. Gold games

### AMETRAD DC1640

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	Amstrad PC1640 DD/CD Colour
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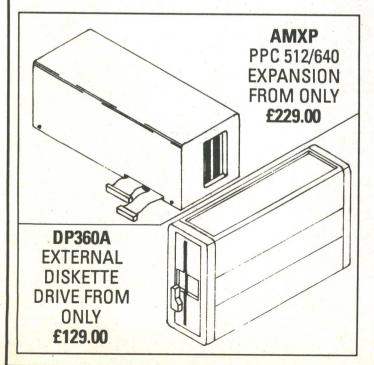
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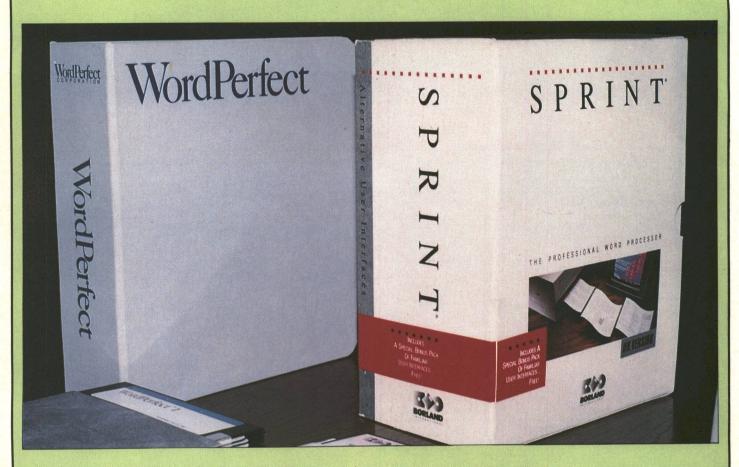
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# WORDY COMPARISONS

Having already reviewed WordPerfect 5.0 and Borland Sprint we now reflect on their relative merits. Francis Botto has subjected both products to intensive use and reports his findings

AS relative newcomers to the professional word processor market, WordPerfect 5.0 and Borland's Sprint seem to be carrying the torch for sophisticated packages which may take their respective vendors into the 1990s. However, though WordPerfect 5.0 (reviewed in the October's PC) and Sprint (reviewed in the November issue) are indisputably competing for a share of the selfsame crowded market, they represent two quite different approaches.

WordPerfect 5.0 is advertised as a complete DTP package with all the standard word processor features – and more. While Sprint, by its very title, is being

promoted as being extremely fast and also incapable of losing text through power interruption.

This is only part of the story of course, as both vendors claim certain common capabilities. Borland has not quite said: "Sprint is a DTP package like WordPerfect", but it does claim it to be one. And as tit-for-tat goes, WordPerfect is reputed to have an automatic backup file just like Sprint's – what a coincidence! There is only one way to get the bottom of this. Over the last couple of months I have been putting both packages through their paces and I can honestly say that there are no untruths in accompanying advertising literature. However, following closer

examination, features which at first glance appear to be shared by both packages differ marginally and sometimes considerably.

For example, both are said to be DTP packages, but WordPerfect 5.0 is a little closer to my impression of a DTP package than is Sprint. Naturally, such a view is a matter of opinion.

Before beginning, I should say that this is not going to be a contest, but more of an effort to find which is the most suitable word processor for you.

To start off, the table opposite shows detailed information concerning both WordPerfect 5.0 and Sprint. And if you're wondering, it is one of those tables which tells you everything and yet nothing, but is a rough guide nevertheless.

## **Files**

If you are the sort of word processor user who needs to flick from one file to another, then the ease with which files may be opened, closed and generally accessed, tells you a great deal about just how obliging a particular word processor is going to be. It has to be said that Sprint wins comfortably in terms of file handling, as it is considerably faster and capable of opening up to 24 files.

Furthermore, all such files may be automatically written to a large backup file extremely swiftly and you may switch from

# Comparison of features offered by Wordperfect 5 and Borland Sprint

	Word Perfect 5.0	Sprint 1.0
Automatic backup facility	•	•
Backup file which stores all open files		•
Book production		
Automatic creation of list of contents Automatic creation of list of figures Automatic creation of list of tables Cross-references End notes Figures Footnotes Indexing List of contents Page numbering Tables		
Customisable		
Full-custom menus Keyboard Macro language Modify menus Screen		
DTP		
Graphics Import graphics from various packages Manipulate graphics  Text Hyphenation Kerning Lists Multiple columns	•	EPS only
Emulations		110
Emulate other editors (Sprint can emulate both EMACs and, as you would expect, Sidekick) Emulate other word processors FinalWord II Microsoft Word WordPerfect 4.2 WordStar Fast Save facility for unformatted text		• • • • • •

	Word Perfect 5.0	Sprint
Files	reflect 5.0	1.0
Capable of opening a number of files Convert files into other formats		
(Sprint is superior in terms of converting files, able to read and write various file formats, including Microsoft Word, Multimate, WordPerfect 4.2 and WordStar.)		•
File management facility  Maximum number of files which may be opened/loaded simultaneously	2	24
Mail merging		
Sort addresses Variable form letters Mouse option Outline facility (Both generate a list in classic 'outline' style. However, Sprint's outline list is only realised after formatting.)	•	•
Spell check utility		
Standard spelling checker Autospell – check spelling as you type	•	:
Spreadsheet type formulae		
Style sheets — which set format options for particular applications	•	•
Thesaurus	•	•
Windows		
Edit and 'window' the same file Maximum number of windows	2	6
Wysiwyg		
Preview text (Neither are truly WYSIWYG, but WordPerfect 5.0 does have a more accurate preview facility, particularly during DTP applications. It shows precisely the page layout, and also permits you to step through your document by pressing PgUp and PgDn or the cursor keys.)	•	•

one file to another using the Pick From List item which may be invoked from the File menu. Even though I've been using Sprint for some time now, I remain impressed by the almost instantaneous transition from one file to the next.

Sprint's file handling is further enhanced

by its windows – six can be opened and a separate file may be accommodated within each if you so require.

Compared to Sprint, WordPerfect's file handling is limited in that only two documents may be opened/loaded. Therefore, if you are working on a reasonable number of files it is necessary to constantly load new documents.

I have no complaints about the slower speed with which WordPerfect 5.0 saves and loads such documents, but the mere fact that you have to repeatedly perform such operations gives rise to a relatively sluggish performance — if you are dealing with a number of files, that is.

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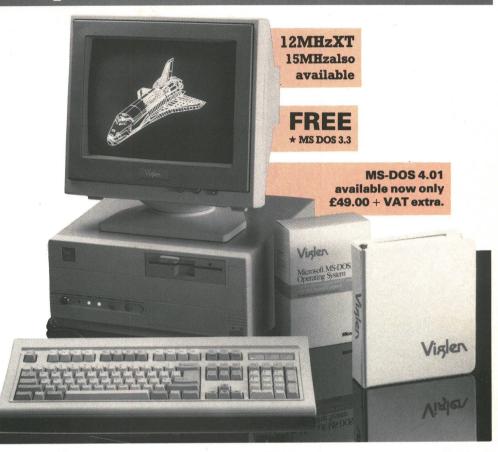
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# Editing speed on single files

Judging from what the respective vendors have said about both word processors, you would logically assume that Sprint is the faster of the two. It has to be said though, that this is not the case while editing a single file.

Surprisingly, the cursor has greater mobility on WordPerfect 5.0. I say this, as it is usually the case that packages with an extensive DTP facet are normally left wanting when it comes to this sort of speed.

Relatively speaking, both word processors are undeniably fast, but WordPerfect 5.0 does have the edge in

terms of cursor speed. And just how much faster is WordPerfect's cursor? With the speed set to 50 characters a second, it moves approximately twice as fast.

Both word processors however, become more equal when the cursor is manipulated by pressing PgUp and PgDn keys along with other key combinations which allow you to move about a document.

When editing a number of files, the situation is understandably reversed, and Sprint becomes the swifter of the two.

An age old fear of word processing is the prospect of losing text – through either a power failure or a machine breakdown. Both WordPerfect 5.0 and Sprint solve this, perhaps paranoiac fear, by periodically writing a backup file. If you think that sounds a bit clever then it has to be said that Borland originally came up with this idea and The WordPerfect Corporation duly adopted it.

# Automatic backup facility

WordPerfect's timed backup file, as The WordPerfect Corporation likes to call it, is slightly less sophisticated than is Sprint's — which proves it's an afterthought. The idea is simple: After a specified period of time, a document is automatically written to a backup file. I have two complaints about

this however: First, the specified period of time must be expressed in minutes. Second, when a file is saved you experience a mildly niggling interruption.

Sprint, on the other hand, automatically backs up files with greater finesse, writing open files to what Borland describes as a swap file – and you hardly know it's happened. A theoretical maximum of 24 current documents may reside in the swap file.

However, for twin floppy users, the swap file is of a fixed size and it is therefore quite easy to obtain a *Disc full* message — which can usually be remedied by closing some files

In Borland parlance, the period of time which elapses between backing up files is called the *Background save period*, and may be varied from a fleeting three seconds to a minute – which is much more precise than WordPerfect.

Separation of the control of the con

WordPerfect's full-page preview

Another important duty of the swap file is to preserve a current editing session the moment you quit Sprint. Consequently, when Sprint is rerun — provided Preserve Editing Session is set to Yes — the swap file regurgitates all open files and your most recent editing exploits. I must admit, loading Sprint to find things exactly as they were left is most convenient — provided you are the sole user of a Sprint installation that is.

# Flexibility

In terms of flexibility, such as the ability to emulate other word processors and convert files from one format to another, Sprint is out on its own, as WordPerfect can't really compete in this area. However, as you would expect, WordPerfect 5.0 does have the ability to convert WordPerfect 4.2 files as well as produce codeless files which will load into any word processor.

Sprint can read and write files in numerous formats, including Ascii, Microsoft Word, Multimate, 'WordPerfect 4.2' and WordStar — to name a few. It can also emulate word processors such as Final-Word II, Microsoft Word, 'WordPerfect 4.2', WordStar plus EMACs and Sidekick editors. Furthermore, you can switch from one word processor to another with considerable ease.

### Customisation

Both WordPerfect 5.0 and Sprint may be customised in terms of the keyboard and there is also scope with regard to creating menus. The ability to carry out this latter variety of modification emanates from their accompanying macro languages. WordPerfect's macro language isn't quite as close to being a fully fledged programming language as is Sprint's, but does nevertheless offer a great deal of potential.

Sprint's C-like macro language facilitates an extreme level of customisation where it is possible to write a whole new user interface, perhaps to emulate another word processor. It is also possible to write macros which manipulate the cursor — in order to count words, for instance.

I mention counting words because I recently wrote a word counting macro as I was dissatisfied with Sprint's facility, which stubbornly insisted on counting formatter commands. I also wrote a macro which opens a number of windows automatically and duly added the feature as a menu item within the Windows menu. I found both processes surprisingly straightforward.

One or two people have levelled some criticism at Sprint, saying that you have to

# THE NEW

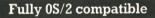
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be a C programmer to customise it significantly. I think that is balderdash.

It is quite possible for blissfully ignorant non-programmers to delve within Sprint's invitingly open structure and rearrange things. This process is greatly assisted by the fact that Sprint's macro language is so readable it is almost like plain English.

WordPerfect's macro language does not offer quite as much potential, but it is possible to design additional menus. Of course, it is no mystery that WordPerfect 5.0 isn't quite up to Sprint in this respect, as Sprint is supposed to be the most customisable word processor in existence — it says so in this letter from Borland.

# Desktop publishing

The line that divides DTP from word processing is becoming finer and finer. WordPerfect 5.0 and Sprint contribute to this blurred identity as both seem to venture into DTP territory. As previously suggested, WordPerfect is closer to being a DTP package than is Sprint. I say this for several reasons which I will now try to explain diplomatically.

First, WordPerfect 5.0 has a far superior preview facility, which allows you to examine your document in the exact manner in which it will be printed. You can view a document full size, twice normal size, or in miniaturised full size pages.

WordPerfect 5.0 versus footband's Sprint and MordPerfect 5.0 and Bordand's Sprint fees for sophisticated packages which may take the macken mackets. However the discember issuel and WordPerfect terney indispotably competing for a share of the represent two quite different approaches advectived as a complete DTP package, we and a few more, while Sprint by 10 very being extremely fast, and incapable of interruption or machine tailure. That at

Word Perfect's double-size page preview

It is also possible to move about this wysiwyg image of a document as you would normal text, which is something you certainly cannot do with Sprint. Naturally, I mention this aspect, as the complexity of documents using DTP often demands frequent observation of the exact printer output.

Sprint's preview facility, however, is not wysiwyg enough for DTP applications. Furthermore, it is a little slow, unlike WordPerfect which is much faster.

Second, WordPerfect 5.0 is able to accept graphics from numerous packages – see table – like Gem Paint, Lotus and even the more sophisticated AutoCad. Once loaded, a graphic may be manipulated in a number of fashions, including

# Windows

An indisputable feature of modern word processing is the use of windows. For example, Microsoft Word allows you to open up to eight. Sprint is capable of opening up to six.

Using them you can view and edit sections of the same file, or work on individual files within separate windows — and you really can sprint from one window to the next. You can also zoom a window so that its contents cover the whole screen.



Sprint's file manager window

WordPerfect is a bit disappointing when it comes to windows. Only two can be opened and it is not possible to view and edit sections of the same document — document being the WordPerfect parlance.

However, if you do wish to window a single document you can load the same file into each of the two documents — but this causes editing problems, as editing carried out in either window will not be reflected in both documents. Needless to say, if you merely wish to edit one file while making reference to another, it's an effective method.

rotation, reflection, and scaling.

Sprint, on the other hand, is rather stubborn when it comes to graphics and will only accept graphic files created using Encapsulated PostScript (EPS) format. Needless to say, WordPerfect's graphics facility is not just useful for DTP but also for documents or reports which include presentation graphics.

### Large documents

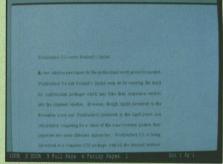
For authors or writers of larger documents, WordPerfect 5.0 and Sprint are ideal, as they both offer the sort of features which really do make an author's life easier. Having recently completed a 65,000 word project using Sprint, I can say from practical experience that its ability to produce an index and lists of contents, figures and tables, is a great assistance when writing such documents.

Cross references are also possible, as they are with WordPerfect 5.0. However, generating a list of contents using WordPerfect 5.0 is much more finicky, demanding headings to be marked and so forth

Presently working on a fairly long document using WordPerfect 5.0, I see certain conveniences in its swift previewing feature and also its graphics facility. But I do miss Sprint's windows and its extra speed when loading and saving files. I also miss Sprint's autospell feature — which checks spelling as you type — along with its noticeably swifter spelling checker.

# Summing up

There is nothing like an ideal word processor, and both WordPerfect 5.0 and Sprint are nothing like ideal word processors. I don't say this disrespectfully, but it's just a fact of life that certain word processor features — or lack of word processor features — and methods of invoking them, will always annoy some people.



WordPerfect's full-size preview

Borland, of course, has made a great effort with Sprint to eradicate the latter irritation by relying upon the user to assign numerous menu items to desirable keyboard shortcuts. However, like WordPerfect, it still has its niggling tendencies.

Which to buy? It pretty much depends upon your requirements. However, if you require efficient file handling, live in fear of losing text, and wish to emulate numerous other word processors and convert various file formats, Sprint is most certainly for you.

If on the other hand, you wish to load graphics from numerous packages and demand more in terms of DTP, then WordPerfect 5.0 seems the more sensible choice.

• Sprint costs £224.95 and is available from Borland International UK, 8 Pavilions, Ruscombe Business Park, Twyford, Berks RG10 9NN. Tel: 0734 320022

WordPerfect 5.0 costs £488.75 – or £50 to upgrade from version 4.2 – and is supplied by Sentinel, First Floor, Wellington House, New Zealand Avenue, Walton-on-Thames KT12 1PY. Tel: 0932 231161

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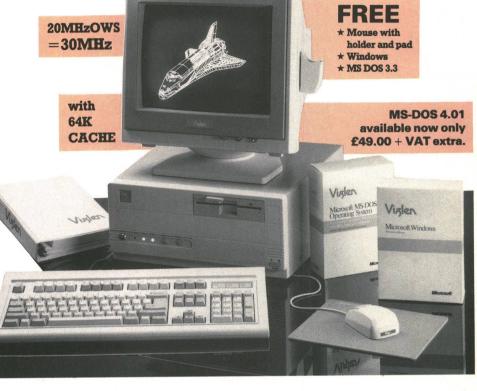
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WE all tend to take what pops up on our computer's screen for granted, but what goes on inside your PC is a fascinating story. In this article I'm going to take a look at one or two aspects of this hidden world, and I hope you'll power up your PC and try the simple tricks I'll be showing you.

If you ponder for a moment on what a single character in a text display looks like, you'll realise that the computer needs to know quite a few things about it before anything can be placed on the screen, such as:

 Where it is – which column and row it's sitting on.

- What colour is the foreground.
- The colour is the background.

And then there's the character itself – all those shapes have to be put together to form A-Z, a-z, 0-9 and so on.

What the PC does is to set aside an area of memory for storage called the video buffer or screen memory. It's not in the same place with every display mode, so in some circumstances you may have to do a bit of fiddling around to find it. But let's have a go, anyway. Everyone has a different type of PC, but most of what I have to say will apply equally to all of you, unless you have a very peculiar machine indeed.

Now I've got a CGA colour machine

and I'm not particularly fond of dealing with MSdos in spindly white letters on a black background. So I've bent my AUTOEXEC.BAT file to produce yellow on black. You can still get less spindly characters with a black and white screen, as you can see from the prompt solution panel on facing page.

In what follows I assume you have changed your screen colours to foreground yellow on black, but you can still have a go at the following if you haven't done so, although the colour information will, of course, be different.

This is what you do. Go into the MSdos directory on a system disc and type DIR to get a nice screen full of material. Now the clever bit — to find out what's going on behind the screens, so to speak.

Enter the following:

debug

No, that's not a program to take viruses out of discs, it enables you to look at the contents of memory — what's inside programs and also what's in particular parts of ram.

After a second or two, up comes a prompt. Not the familiar MSdos A> or C>, but a minus sign. At the minus sign, type (either in caps or lower case):

D B800:0000

Then type D again, plus Return, of course. The D stands for display, or show a section of memory, and up pops on the screen something like Figure I. The figures on the left show the address and segment of memory — it's all in hexadecimal — and the central section lists the contents of the memory. On the right hand side you can see the Ascii equivalents, padded out with full stops for non-Ascii characters.

The particular section of memory which

John Whiting
takes you behind
your PC's screen
and invites you
to try out some
tricks for
yourself



# EATURE

we have targeted is the beginning of the video buffer area on a colour text display. Let's look in detail at the first line of the listing to see if we can fathom out what is going on.

The first thing which should strike your attention is that between the recognisable filename, extension and the rest, the figure OE in hexadecimal appears with monotonous regularity in alternate ram locations.

What is going on here? Well, in order to sort out that little problem we're going to have to convert the hexadecimal number OE – 14 in decimal – into binary, the pattern of zeros and ones which is all the computer understands.

If we convert 0E into binary, this is the result, padded out to the full eight bits that make up each byte:

# 00001110

Now if you promise not to laugh, let me tell you that half a byte is a nybble. The name was obviously dreamed up by some computer wizard after an extended visit to the local hostelry, but we are stuck with it.

Life is seldom simple — if it were people like me would be out of a job. So the figures listed in the box for the PROMPT command and the appropriate colours don't match up at all to the colours which appear in the screen dump of the video buffer area.

These are the equivalents:

Black = 0000Yellow = 0110

Incidentally, yellow is sometimes referred to in the technical manuals as brown – but that's way over my head. Why those numbers, you'll see in a moment.

You will have noticed, that if you add black, the background colour in the left nybble to yellow, brown, or whatever you want to call it, in the right, you get:

# 00000110

which isn't quite the same as what appears in the actual byte itself:

# 00001110

No problem. The highest bit of the nybble is set to 1 if the colour is intense, which it is in the case of my own customised screen.

So let's dig a little deeper into this question and work out for ourselves what bit pattern represents what colour. The answer goes like this. Of the four bits in each nybble:

 Bit 1 – the leftmost one – is on if the intensity is high (right nybble only. In the left it

Turn to Page 24 ▶

# A Prompt solution

Here's how to tickle up the appearance of the characters on your screen. First, if you haven't already done so for other reasons, you need to do a spot of editing. That's no hardship — you just add a line to the CONFIG.SYS file in your boot disc's root directory.

The easiest way is to use a little known feature of COPY. First ensure that there's enough room on your disc and that it's not write protected. Now type in:

# COPY CONFIG.SYS+CON

At this point you should get a couple of message lines, and then a blank line with the cursor eyeing you curiously. What you are about to do is append to CONFIG.SYS — that's what the plus sign is about — from the CON device, in other words, the keyboard.

We're adding just one line, so type this:

# DEVICE=ANSI.SYS

Now press Return, and to close the file you need to do two things:

● Type Ctrl+Z, which will be echoed on the screen as ^Z. That's the end of file marker.

Now press Return by itself, and you've appended an instruction which loads the enhanced screen driver when you boot up your machine. TYPE the CONFIG.SYS file just to prove you have done it.

Be sure that ANSI.SYS is on your boot disc — it can be found on your original system disc — and you are ready for business. Reboot your PC, then you can

experiment with the PROMPT command in a variety of ways. Let's just do the colour business first.

To get your screen to change into yellow on black, type:

PROMPT \$e[1,33,40m PROMPT \$n\$g

Do be careful to get this right, as PROMPT is a temperamental little beast. The commands are case sensitive, so if it's lower case \$n\$g you must avoid upper case.

The first Prompt line says: In video mode one (80x25 text) use foreground colour 33 (yellow) and background colour 40 (black). The Se stands for the escape character (Ascii 27), since this is what's known as an escape sequence. You may be familiar with the dreaded escape sequences from mortal battles with your printer.

If you like the result, add these two lines to your AUTOEXEC.BAT file by means of the COPY AUTO EXEC.BAT+CON technique described earlier. The range of possible CGA colours using this method goes like this:

1-0	reground colours	Ba	ackground colours
30	black	40	black
31	red	41	red
32	green	42	green
33	yellow	43	yellow
34	blue	44	blue
35	magenta	45	magenta
36	cyan	46	cyan
37	white	47	white

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B800:0000	45	OE	44	OE	4C	OE	49	OE-4E	0E	20				20	OE	E.D.L.I.N
B800:0010	20	OE	45	0E	58	OE	45	0E-20	0E	20	0E	20	Charles C	20	King organies	.E.X.E
B800:0020	31	0E	36	OE	34	0E	34	0E-34	0E	20	0E	20	0E	31	0E	1.6.4.4.41.
B800:0030	34	OE	2D	0E	30	0E	37	OE-2D	OE	38	0E	36	0E	20	0E	40.78.6.
B800:0040	20	0E	31	OE	32	OE	3A	0E-31	OE	35	0E	20	0E	20	0E	.1.2.:.1.5
B800:0050	20	0E	20	0E	20	0E	20	0E-20	OE	20	OE	20	0E	20	0E	
B800:0060	20	0E	20	OE	20	0E	20	0E-20	0E	20	0E	20	OE	20	0E	
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-d																
B800:0080	20	0E	20	0E	20	0E	20	0E-20	0E	20	0E	20	OE	20	0E	
B800:0090	20	0E	20	0E	20	OE	20	0E-20	OE	20	0E	20	OE	20	OE	
B800:00A0	52	OE	45	0E	43	OE	4F	0E-56	OE	45	OE	52	OE	20		R.E.C.O.V.E.R.
B800:00B0					58	OE	45	0E-20	0E	20	0E	20	0E	20	OE	.E.X.E
B800:00C0	20	OE	38	0E				0E-34					0E			.8.5.4.41.
B800:00D0				OE		OE		OE-2D							0E	40.78.6.
B800:00E0	20	OE	31	OE	32	OE	3A	0E-31	OE	36	OE	20	OE	20	0E	.1.2.:.1.6
B800:00F0	20	OE	20	OE	20	OE	20	0E-20	OE	20	OE	20	0E	20	OE	

Figure I: The video buffer area

# EATURE

### **◄ From Page 23**

indicates flashing).

- Bit 2 is on if the red gun is firing.
- Bit 3 is on if the green gun is firing.
- Bit 4 is on if the blue gun is firing.

Let's try and fathom out a couple of colours from the available list. Cyan is, according to my dictionary, a highly saturated green-blue, and violet is purplish blue. So if we felt like summoning up intense cyan on a violet background, and had our migraine tablets at the ready, the bit pattern would be:

10110101

And one more for luck, intense white on black would work out as:

00001111

## Over the border

Having learned a few tricks with colours, you'll have seen that if you select a background colour other than black there's a black border round the PC's screen.

Wouldn't it be nice if you could change the border colour as well as the main foreground and background colours? Well it can be done with a bit of low cunning and our friend Debug. Load Debug, but in a slightly different way from before:

DEBUG BLUE.COM

The minus prompt will come up as before, this time accompanied by an error message telling you that the file – BLUE.COM – is not found. For once, you can safely ignore the error message. We'll be needing BLUE.COM, but not for a minute or two.

The COM extension means we shall be creating a file that will be able to be executed as a program just by typing BLUE. You are now going to write a short assembler program, but don't worry if you've never done anything of the sort in your life. Just follow these instructions, and all should be well. We will use four of Debug's commands, which I'll briefly explain first. Don't worry if it goes a bit over your head though:

A: Assemble, or type in one or more assembler instructions.

RCX: Read (and possibly alter) the contents of the CX register.

W: Write a file to disc.

U: Unassemble.

Now take a deepish breath and, remembering to press Return after each of the

-U 100		
199A:0100 B309	MOV	BL,09
199A:0102 B700	MOV	BH,00
199A:0104 B40B	MOV	AH, OB
199A:0106 CD10	INT	10
199A:0108 C3	RET	
199A:0109 0000	ADD	[BX+SI],AL
199A:010B 0000	ADD	[BX+SI],AL
199A:010D 0000	ADD	[BX+S1],AL
199A:010F 0000	ADD	[BX+SI],AL
199A:0111 0000	ADD	[BX+S1],AL
199A:0113 0000	ADD	[BX+SI],AL
199A:0115 0000	ADD	[BX+SI], AL
199A:0117 0000	ADD	[BX+SI],AL
199A:0119 0000	ADD	[BX+SI],AL
199A:011B 0000	ADD	[BX+SI],AL
199A:011D 0000	ADD	[BX+SI],AL
199A:011F 0000	ADD	[BX+SI], AL
-		
-		
-		
- 4		
-R CX		
CX 0000		

Figure II: The blue program

following lines, type:

A 100

That tells Debug that you are about to start typing in assembler instructions, starting at location 100 (for reasons which are far too boring to go into here). Then type in the following, being careful to be absolutely accurate:

MOV BL,9 MOV BH,0 MOV AH,0B INT 10 RET

Now press Return again to get back to the minus prompt. To prove that you've done it, you can unassemble what you've just assembled by typing:

U 100

You'll see in Figure II what happened when I unassembled my program and used **G** to get it to Go. Use **G** with care — it's preferable to save a program to disc, and then run it from the MSdos prompt, otherwise the system could hang.

Here's a brief word of explanation of what you have typed in – and for those of you unfamiliar with assembler, it's only the first line that matters. The BL register is loaded with the value 9, which in binary is 1001 – and if we check that against the nybble values we've seen before, 1 =

-R CX CX 0000 -N B: BLUE. COM -W Writing 0000 bytes -R CX CX 0000 :9 -W Writing 0009 bytes A>DEBUG B: BLUE.COM -N B: RED. COM -A 100 19B0:0100 MOV BL,C 1980:0102 Program terminated normally

Figure III: From blue to red

intense and 001 = blue.

So we are going for an intense blue background. The second instruction tells the video display to retain the current palette of colours, the third is the parameter for the next instruction, one of the

Turn to Page 26 ▶

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# EATURE

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many interrupts which are so crucial to the workings of the PC. Interrupt 10 (in hex – all the numbers are in hex) deals with the video display, and when called with value OB it alters the border colour. RET returns us back to the MSdos prompt.

Now all we have to do is to save what we have typed in to the file BLUE.COM. However, things never are as straightforward as they ought to be, because if you just type:



for write, you'll get a message to the effect that you have written 0000 bytes to the file. This isn't very helpful because the program occupies eight bytes, as you can see from the numbers that came up as you assembled it.

That's where the **RCX** command comes to the rescue. In order to know how many bytes to save, Debug requires you to deposit the number required into the CX register. It's quite easy. Just type:



and up comes a number, 0000 plus. Type in 9, and Return twice. Why 9? I always add a byte for luck. Then if you use the **W** command, you'll get the appropriate number of bytes written.

To quit from Debug the command is **Q**. Take another deep breath, and type:

BLUE

and you should get an intense blue border to your screen. From now on, you should be in a position to change the border more or less as the fancy takes you. All you need to do is to run Debug again, reloading the BLUE.COM file, like this:

DEBUG BLUE.COM

Then follow these instructions carefully. Type this line:

N RED.COM

You have now named what you have loaded as Red. All you now have to do is to change the first assembler command, using this format:

A 100 INT BL,XX

where XX is a value which gives you the border colour you want, according to the bit patterns we went through earlier. Then just type **W** to write it to file – no need to tell your PC how many bytes this time, because it kept a count of them in CX

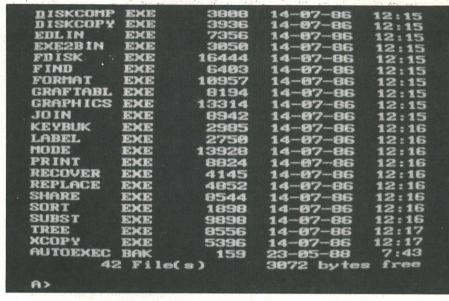


Figure IV: Mode 40 directory listing

when it loaded the BLUE.COM file. See Figure III for the results.

Now that you can liven up your life with border colours to suit your mood. Let's turn to one more little trick with the PC screen.

# Are you in the mode?

Finally, let's have a brief look at quite a different aspect of the screen. Those of you who graduated to the PC via a BBC Micro will be familiar with the notion of screen modes, eight in all with the BBC B, from an almost illegible 80 characters in Mode 0 to Mode 5, for example, with huge letters that look as if they've been sat on by the fat lady at the circus.

Not a lot of people know this, but you can swap between two modes on the PC by using the external command MODE. External means that it is sitting on the disc, not in memory. So try typing from your MSdos directory:

mode CO40

and then type:

dir

and you can see from Figure IV just what happens. To get back to the original mode, type:

mode CO80

The parameters are either 40 for 40 characters or 80 for the default screen. CO stands for colour, and there's also the option of BW, for black and white.

Why on earth should the PC have an option like this? The answer is for the same

reasons that it has a number of commands to deal with the cassette port. IBM thought at the time the machine was first released that there would be a demand for cassette-based systems, but it appeared just as the disc drive was really beginning to dominate the scene.

The 40 column screen mode option was on offer because it was thought that anyone using a composite video monitor or a TV screen would not be able to read the characters on an 80 column screen because of the poor definition. The only real use that 40 columns gets nowadays is for title screens and the visually handicapped.

So that's a quick look at some of the mysteries of the PC screen. There's a great deal more to it though, and I'll come back soon and tell you about swapping pages, the character sets, graphics screens, and a few more little tricks besides.

### The different screen formats

**MDA**: Monochrome Display Adapter (that's the original black and white format of the IBM PC)

**CGA**: Color Graphics Adapter (also available from the first days of the PC in 1981)

EGA: Enhanced Graphics Adapter

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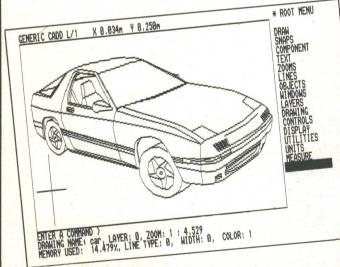
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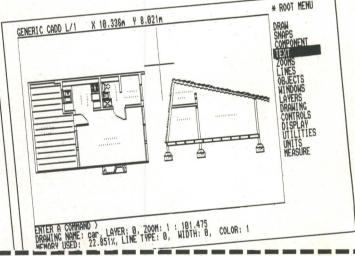
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HAVING only recently come to terms with the blessings of budget software, it seems the unsuspecting public is now being besieged by even more economical offerings. But just how little do you pay before things start to get tacky?

Having seen a number of sub-£70 book-keeping programs recently I must admit to not being overly impressed, so when Money Manager PC arrived I wasn't expecting an earth-shattering experience.

According to Connect Software, the majority of customers need an easy-to-use accounting package where no knowledge of accounts is required, yet is flexible enough to suit individual circumstances. Money Manager PC is designed to fill this demand, and comes from a long line of similarly named products available for the Amstrad CPC and PCW machines.

Although this type of application is traditionally marketed as a personal banking system, the PC version of Money Manager also offers Vat facilities, so must therefore be classed as a contender for the serious business sector.

### **Files**

Coming on just one floppy, the program is equally at home on a single – provided you have a 720k disc – or dual drive machine, or indeed residing in its own directory on a hard disc.

Installation is fully automatic and in no time you are presented with the attractive opening screen. The main menu which follows appears somewhat cluttered at first glance, mostly due to all the available options being displayed at once. Although I can see the point in this approach, Money Manager tends to look unnecessarily complicated as a result.

Before processing can take place you must first create or load a data file, revealing Money Manager's home micro heritage. The program helpfully provides a directory of the available files, and moving the highlight bar to your choice and pressing Return is all that is required to make a selection.

If you are creating a fresh data file, a useful facility also enables the automatic copying of existing code layouts to your new set-up, thus saving a lot of repetitive typing. Each file can have a maximum of 500 transactions a month with up to 20 accounts plus 50 marks and classes. In this system an account would constitute either a credit card, cash on premises or bank account. Classes are the headings used by Money Manager to analyse income and expenditure.

A mark is simply a further optional code

# MAKING THE RIGHT CONNECTION

Is it worth book-keeping on a budget? Tim Woodward tries it with Money Manager PC and is pleasantly surprised

available at the time of posting transactions, and might be used to differentiate between inter-company departments and the like. On the tutorial front, sample files for both business and personal use are provided, and highly informative context-sensitive help is but an F1 key press away.

# Daily processing

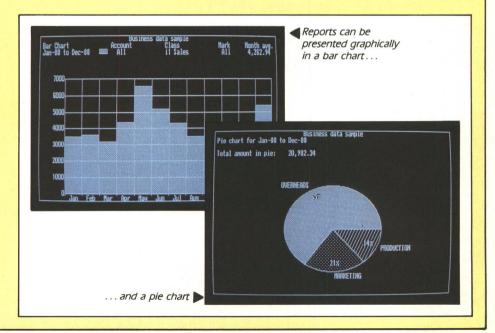
During the posting of transactions all the previous entries for that month are displayed. You can then either insert a new line by moving to the position required, or tack your addition to the end of the list. The postings you append can easily be sorted into date order at a later stage, and

it is also possible to edit or even delete existing incorrect entries.

As you are processing the entire month in memory at once, any changes will immediately affect analysis reports and Vat totals alike – not quite so easy to achieve using the relational database systems mentioned in the panel.

While on the subject of posting transactions, Money Manager also provides a standing order list from which you can paste entries into the accounts, selecting just those you wish to include at the time. I was surprised, however, to find all entries requiring either a debit or a credit amount. This seems to be a retrograde step, and

Turn to Page 32 ▶



### **◄ From Page 31**

defeats the purpose somewhat. To comply with the assertion that "no accounting knowledge is required" there should surely be separate routines for receipts and payments, with the debits and credits handled by the system.

# Printed output

All reports destined for the printer can also be previewed on-screen, properly formatted and scrollable too, rather than the quick and dirty list often provided. Monthly analysis of classes, marks and accounts can be taken, with selection criteria allowing exact tailoring for specific results. The Vat report also includes a useful summary, which aids Vat return completion and permits a swift preview of liability during the quarter.

Almost as an afterthought Money Manager also includes bar and pie chart output for selected comparisons, and although I was amazed to find the program recognised my machine's VGA graphics capabilities, there is unfortunately no means of printing the result – except by the Shift+PrtScrn key combination that is.

# Added extras

For a program of this type, Money Manager certainly offers plenty of extras, many of which could spoil anyone subsequently upgrading to more pretentious accounting suites. Apart from the ease of editing previous entries mentioned above, there

# **Memory restrictions**

Applications written for home computers typically carry out all processing in memory, external media access being confined to the initial loading of data and the subsequent saving of the altered information when you're finished. This is a hangover from the days when data was often stored on tape, providing only sequential access to each piece of information in turn.

Money Manager PC has inherited this method of operation from its home micro predecessors. The number of transactions and accounts accessible are therefore dependent on memory size, and consequently less than might be expected — for an accounting package aimed at the business sector that is.

By comparison a typical small business accounting suite such as Sage Bookkeeper can manage 1,000 accounts in each of its nominal, sales and purchase ledgers, with the number of transactions limited by disc space alone. The random access method of file management used by the Sage product, and indeed the majority of business software, not only provides an environment capable of storing vast quantities of data, but also the means of accessing any part of that data virtually instantaneously.

# Minimum machine requirements

384k of memory and either Hercules, CGA, EGA or VGA graphics adapter.

are also a number of other facilities sadly lacking from the upmarket competition.

For instance there's the on-screen bank reconciliation routine where you achieve a reconciled balance by simply ticking the items on file also appearing on the statement. You can also search for any given string of characters in the reference, description and even amount fields — what a boon for finding that cheque for £9.63 which somehow was never actually cashed.

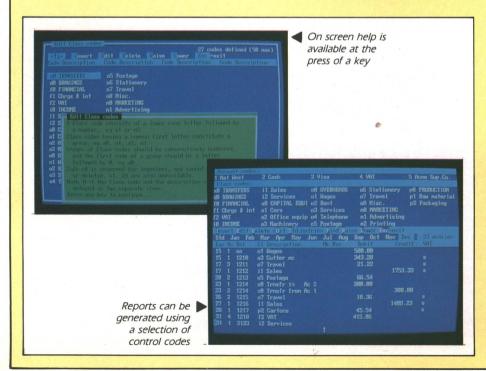
Macros are another feature of Money Manager often overlooked by other systems, but which offer great scope for repetitive entries. Connect recommends their use for often-used reports, where the lengthy selection criteria would otherwise need typing every time.

# Summary

The documentation provided with Money Manager is mostly a run through of the various menu options in the order they appear on screen. This means coverage of creating and editing account codes, for instance, is long past where this action is required by the operator.

The program is well coded, with pop-up Help screens and intuitive key presses given paramount importance. You can type an endless string into some of the prompts – such as a row of Xs in the date field for instance – and this needs attention, but the program does on the whole have a professional feel.

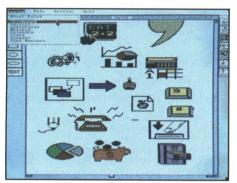
At this price Money Manager is one of the best incarnations to date of this particular genre. It doesn't replace a full accounting suite by any means, but provides a useful alternative for those who simply wish to keep a track of their bank account.



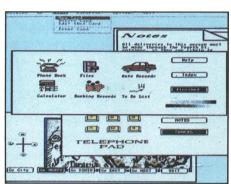
# CHECKLIST

- Product: Money Manager PCPrice: £49.95
- Supplier: Connect Software
  Tel: 01-743 9792
- > FOR: Ease of use, on-screen bank reconciliation, string search facility and keystroke macros. After sales support free and for an indefinite period.
- AGAINST: Cluttered main menu, limited by file handling design, debit and credit operation.

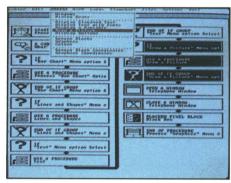
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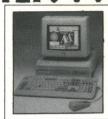
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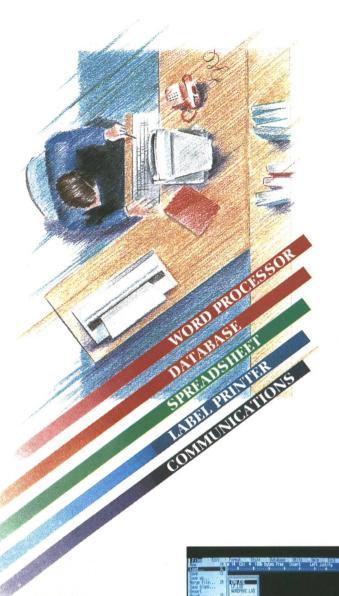
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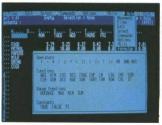
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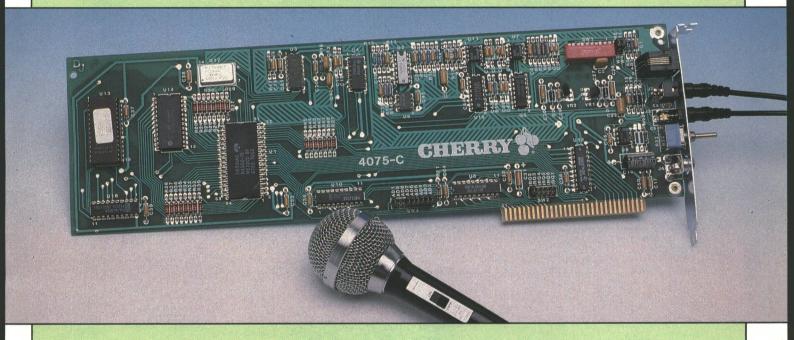
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You can order Mini Office Personal using the form on Page 125 EVIEW

## ANOTHER WORD IN YOUR PC's EAR

Peter Hartley has been talking to his PC again — this time with the aid of the latest voice-recognition system from the Cherry Corporation of America



IN the December 1988 issue of PCA I reviewed a suite of software and hardware called Intro-Voice which allowed any PC to be accessed merely by talking into a microphone. I said at the time that this would be a great advantage to the physically handicapped.

Now the system has been greatly improved and released as Voice-Scribe 128. The basis of the new system is as before: You put an expansion card in your PC, run the software and train it to recognise the way you pronounce words.

The main differences between the two versions are the way in which speech application programs are developed and the keyboard emulation utility — an interface which allows you to control commercial programs with speech.

Using the keyboard emulator – called DragonKey after its developers, Dragon Systems – you can enter words, phrases, numbers or letters into word processors, spreadsheets, databases or any other application. As far as the application is concerned, the characters came directly from the keyboard.

Voice-Scribe 128 will work on any PC or

AT compatible with at least 512k of memory and preferably a hard disc. Installation consists of inserting the expansion card in a spare slot then running the install program. A variety of speech-input devices can be used, from an ordinary hand-held microphone to a telephonist's headset device

All the software is copied from drive A on to your hard disc. Your CONFIG.SYS file is altered to contain the correct driver command and your AUTOEXEC.BAT file is amended to include a path command to the VS directory.

All you have to do then is train your PC to recognise your voice and the way you pronounce words. The first word you train is TRAIN!

This enables you to call up all future words without touching the keyboard. Let me explain

To put your PC into training mode for the first word you have to call the program and press the spacebar to accept the first word in the list. That word is *TRAIN*. To call the next word, *ENTER*, all you need to do is say *TRAIN* into the microphone.

When you have finished the training session you will be able to call up Voice-

Scribe and control many Dos applications – such as Copy, Format, Diskcopy and so on – without once touching the keyboard.

#### Interfacing applications

The program which makes it possible for you to control your applications by speech is called DragonKey. Instead of typing commands you talk into a microphone attached to the expansion card. Dragon-Key recognises those words and interprets them as commands.

The chances are fairly high that your word processor or other applications were not designed for voice control. Therefore, to work with them, DragonKey has to convert your spoken commands into simulated key strokes.

It uses overlays to tell it which voice commands to listen for and what key strokes to generate when a specific command is recognised. Using this system, you can generate one overlay for your word processor, one for a spreadsheet and so on. It keeps the sizes of the files to a level which can be accommodated in ram.

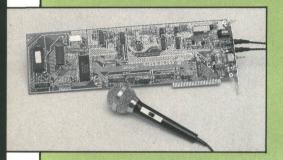
Turn to Page 38 ▶

#### **◄ From Page 37**

Memory overheads are not too high — about 18.5k of ram is taken up by the system with another 65k reserved for overlays; this can be varied. The only program I couldn't run on my 640k PC was the memory-hungry Ventura DTP package.

There are others about which need maximum memory – such as Ashton-Tate's Draw Applause – but in general most applications won't miss the small amount of ram used by Voice-Scribe.

The 211 page, ring-bound manual gives step-by-step instructions on fitting the expansion card, including changing the interrupt level and the I/O address. However, unless you have other expansion devices installed which clash with



Voice-Scribe's factory setting, you will not have to make any changes.

After the section on installation, a complete guide to using the system is provided. Working examples are used in every step and by the end of the manual you will be able to configure Voice-Scribe to interface with any application you may have.

#### Creating overlays

As I mentioned earlier, the system uses overlay files to convert the spoken word into simulated key strokes. To create an overlay file you first write a text file which contains the words you want recognised.

Next you run a program called VOCL which creates a language definition file and saves it with an .LDF extension. Your text file shows the spoken word followed by the keystrokes to be generated. For example, to obtain a directory listing you would enter the following line:

#### directory "dir";

All you need to do after running VOCL is train the system to recognise your pronunciation of the words in the file and you are ready to go. You can include Con-

trol and Alt functions as well as cursor and function keys.

Ready-made .LDF files are included for Lotus 1-2-3, dBase, Dos, Multiplan, DisplayWrite, IBM's Personal Editor and a punctuation marks definition file.

#### Summary

The original Voice-Scribe was good, and this version is better. If you need to be able to control your PC without using the keyboard, you can't do better than take a look at Voice-Scribe 128.

#### CHECKLIST

- Product: Voice-Scribe 128
  - Price: £395
- Supplier: Cherry, Coldharbour Lane,
  - Harpenden, Herts AL5 4UN Tel: 05827 63100
- FOR: Extremely comprehensive manual. Easy to set up and use. Complete system for hands-off operation of a PC.
- AGAINST: Needs an able-bodied person to install and set up, but there is no way around this.

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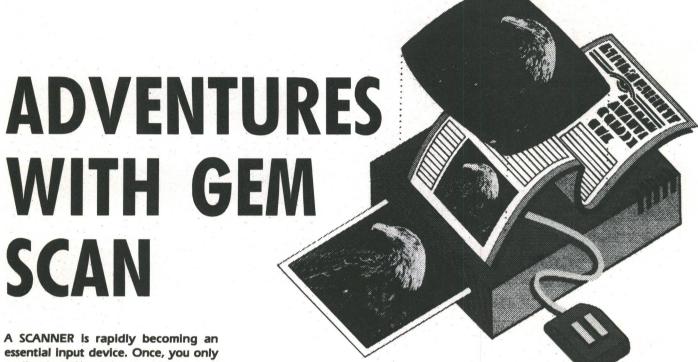
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## Mike James examines the equipment needed to incorporate freehand drawings or photographs into your DTP applications

A SCANNER is rapidly becoming an essential input device. Once, you only really thought about owning one if your main application was desktop publishing (DTP). First you bought a laser printer so you could see what you were producing, and then you added a scanner so you could input hand drawn or printed graphics.

In practice the need to input graphics to DTP programs is fairly spasmodic — unless you are running a graphics design or scanning bureau — and as a result, many a costly scanner sits idle. However if you add optical character recognition (OCR), a fax card and a standby photocopier to the list of applications then a scanner begins to look like a much more justifiable expense.

OCR uses special software to read printed documents into standard word processor files. Add a scanner to a fax card and you can send other fax machines printed documents and diagrams. If you scan a document and directly output it to a laser printer you have a photocopier. For all these reasons, scanners are likely to become standard issue with every laser printer.

Even if scanners become thick on the ground there is still the question of what to use to drive them in their native DTP application. The answer of course should be Gem Scan – what else? In order to test this assumption I borrowed a Canon IX-12 flat bed scanner. Although I had used low cost hand held scanners before none was supported by Gem Scan and the general standard of the scan utility programs supplied was either low or non-Gem.

The Canon IX-12 is a high quality 300dpi scanner that works much like a photocopier. You place the original on a glass plate. The light sensor and source of illumination is below the glass and tracks

slowly down the document when a scan is in progress.

The nice thing about this arrangement is that you can scan anything which fits into a standard photocopier and scanning is all under software control. Using a hand held scanner you have to pass it over the paper manually.

Gem Scan comes with the latest version of the Gem, but you can install it to run under an existing Gem system or even under Windows! Installation is trivial, but doesn't follow the description in the manual.

#### Simply set up

Rather than a criticism, this really only goes to prove that the installation procedure doesn't really need explanation. You have to select the make of scanner you are using from a list and some supplementary details concerning its exact configuration, but that's all.

Once installation is complete you can begin to use Gem Scan. As well as starting it up from the Gem Desktop by double clicking on its icon, you can also run it from MSdos by typing the command SCAN.

This is presumably a concession to anyone using a non-Gem based DTP system. When I first started Gem Scan its opening display appeared and then it seemed to hang. I tried starting it a second time and was treated to a repeat performance.

This time I left the PC alone while I started to look things up in the manual. When I looked up I was greeted by a warning message telling me my printer wasn't responding — retry or cancel.

Clearly Gem Scan has its own direct line to the printer which it checks is working. As far as I know this is unique behaviour among Gem applications and accounts for my unwarranted assumption that it had crashed.

Once over this tiny hiccup, Gem Scan worked to specification. What exactly the specification is depends very much on the features provided by the scanner you are using – but first the basics.

Two modes of scanning can be selected by clicking on buttons marked Q for Quick or H for High resolution on either side of the start button. The Quick mode is used for lining up and selecting the area to be used for the final scan.

When you have composed the image a quick click on the O button and a re-scan captures it in high resolution. This feature alone is worth its weight in gold and has the potential to save hours.

The scanned image is written to disc and then displayed in a frame on the screen. A disc is used as intermediate storage for

#### EATURE

most operations — anything but a hard disc system would run so slowly that you might as well spend the time redrawing the original.

Before scanning you can set the paper size, which determines the area to be scanned. Afterwards you can alter the size of the frame by dragging sizing ticks in the way familiar to users of Gem Draw and such.

Altering the frame keeps the image the same size on the screen, but subsequent scans are restricted to the area marked out. Scanning only the portion of the image of interest saves time and avoids having to tidy up unwanted borders.

Other features you can alter while scanning include the brightness level and horizontal and vertical scaling. By moving a slider you can compensate for a overly light or dark original. The Canon scanner I used didn't support scaling, so I couldn't try it out.

To check the final quality of the image you can display it at magnifications of 0.5x, 2x, 4x and 8x. Viewing the full image on a standard screen is really only good enough to check composition.

You have to move to 2x or 4x before you see the sort of detail which appears on a laser printer. Even so, I was at first amazed by the difference between what I saw and what was printed.

#### The laser look

The laser-printed output looked so much better than the displayed image and, if you didn't know this, you might even be tempted to scrap a perfectly good scan and start again. However, after a little use you learn to suspend judgment until you see a printed version.

There are two methods of scanning — line art or halftone. If you choose to scan line art then every tone in the image will be either black or white. A halftone scan attempts to represent intermediate shades of grey by using patterns of dots. To show you what a line scan looks like I scanned in part of the back of the Gem Scan packaging — see right. This also shows you what Gem Scan looks like in action.

As an example of a halftone scan I used part of the front of the Gem Scan packaging – see facing page. In halftone mode you can select one of a number of different types of dot pattern in an attempt to produce the highest quality output.

Once again the Canon scanner didn't support this feature, so I couldn't try it out. That's not to say I didn't produce highly successful halftone images — I did, but I would have liked the chance to experiment.

Once you have scanned an image you can save it to disc or print it directly. Image files can be saved in either .IMG format, the sort produced by Gem Paint and accepted by Gem DTP and many other



Gem programs, or TIFF format, used by a number of non-Gem applications.

Gem Scan includes a complete image editor. You can either load an image from disc or scan one in and then switch to edit mode. You might be rather surprised to find that Gem Scan has a built-in editor, after all what's Gem Paint for?

I quickly found out why Gem Scan has its own editor as soon as I tried reading a scanned file into Gem Paint. The problem is that scanned images are just too large for Gem Paint to hold in memory, so all you see is a tiny corner of the full image.

What's more, if you then save the file it is truncated to just the part that was displayed on Gem Paint's screen. The Gem Scan editor is needed to allow different sections of an .IMG file to be read to and from disc. This means the editing facilities provided by Gem Scan are the only ones you are likely to be able to use on a scanned image – so they are important.

The editing tools you are provided with are flip horizontal, flip vertical, rotate left, rotate right, microscope, complement pixels, erase everything within the frame and erase everything outside the frame.

All operations work on the area of the image marked out by a frame which you

can move into position and size using the mouse. In practice I found this the biggest problem because when the frame becomes too small it loses its sizing ticks and you have to zoom in to continue using it.

The flip and rotate operation make extensive use of the disc to manipulate the entire image so be patient if the frame is at all large. Gem Scan keeps you informed of how it is doing by showing a histogram bar display of how much of the job has been completed. Rotating a whole image can take as long as 20 minutes, so be patient.

The only real editing facility is the microscope which is more or less identical to the one in Gem Paint. Using this you can set or reset individual pixels within a tiny area of the screen. You are also shown an actual size version of the section you are working on so you can judge the effect your surgery is having.

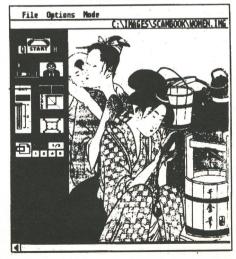
The microscope is a good tool for fine adjustments, but you can't really use it for adding features. In particular there is no way you can add text to a scanned image. Of course if the image is destined to be read into a DTP package, you can always add typeset captions and labels but otherwise, you might find it something of a problem.

In short, the editing facilities offered by Gem Scan are OK as far as they go but I can now see a need for a more sophisticated version of Gem Paint — one which will work with images too big to be held in memory by paging sections from disc.

My final feelings about Gem Scan are partly governed by its performance with the Canon scanner. Compared to the hand scanners I have used it was a pleasure. All I had to do was click on the start button and the scanner whirred into life.

I was a bit disappointed it didn't support some of the more interesting features of Gem Scan but, overall they made a good team, producing some very high quality results with minimum fuss. However, I think I would want Gem Scan no matter what scanner I was using.

#### Scan Mode



#### **Edit Mode**



#### EATURE

# HOUSE

Ken Hughes visits Commodore's UK headquarters "THE Amiga is doing so well that we can afford to leave it to its own devices while we concentrate on our PC range". So says Steve Franklin, Commodore UK's managing director.

"I want to put Commodore back into its historical position as the number one business computer", he explained "Don't forget, Commodore's full title is CBM – Commodore Business Machines".

Steve Franklin — who has previously worked for Rank Xerox and Granada Businesscare — was recruited by Commodore in 1987 to bolster a flagging sales performance. The first thing he did was to instigate a quality control department at the company's Peterborough distribution plant. Here, each computer is unpacked, tested and then — if it passes — repacked and shipped.

This got him into hot water with his

American bosses. "Their attitude was that quality was checked at the end of the assembly line and doing it again was just a waste of money. What they seemed to forget was that the equipment had been through an arduous journey from America, Germany or Hong Kong — depending on where the machine was made".

However, Franklin stuck to his guns, pointing out that he had reduced the failure rate on reaching the customer from around 20 per cent to less than 1 per cent. Now the Peterborough plant has over 50 quality control inspectors and, because of the rapid rise in sales, could soon be employing even more.

Next he set up a system of on-site service with Europe's largest third-party maintenance group. One service contract gives the end-user a four-hour call out facility – essential if your business depends on the PC being in working condition.

"I aim to make the name Commodore synonymous with quality, value for money and excellent after-sales service", he said.

At the moment, one result of Franklin's policies is that most people immediately think of the Amiga or the C64 when they hear the name of Commodore. The plan now is to engender the same reaction for the company's PC range.

To achieve this ambition, Franklin has determined two distinct target areas: Large corporations and the small businessman and professional. Commodore itself will negotiate the sales with the corporate buyers and then offer the sale to a dealer who is capable of servicing the customer.

The company's specially selected and trained dealer network will be left to supply small businesses backed-up by carefully targeted trade advertising. By the end of the year, Franklin's plans could well have come to fruition and Commodore UK will be a major force in the PC market.

# FULL STEAM AHEAD FOR THE PC



Commodore's UK crew

#### A wide range

Commodore's PCs start with the budget priced, mono-display version of the PC1 at £362 — including Vat as do all prices quoted — and end with the top of range, 80386-based PC60-80 40T complete with 80Mb hard disc and a 40Mb tape streamer at £4,138 for the EGA version.

The PC1 has an 8088 CPU running at 4.77MHz, 512k of ram expandable to 640k, a single 5.25in floppy disc drive and CGA-standard graphics. Because of the slimline design of the PC1, any expansion other than memory has to be done externally.

The PC10-III and PC20-III — the only difference is a 20Mb hard disc in the latter machine — are based around the 8088 CPU but can run at three speeds, 4.77, 7.16 and 9.54MHz.

There is a choice of one or two, 5.25in

floppy drives on the PC10- III — the PC20-III has one along with its hard disc. Mono and CGA graphics are standard and EGA is available as an optional extra. Three internal slots are available for user expansion.

The latest additions to the range are the PC 40/20 and the PC 40/40. The main differences are a 40Mb hard disc and EGA graphics as standard on the latter machine.

The CPU is an Intel 80286 running at 6 or 10MHz. 1Mb ram is standard as is a single, 1.2Mb, 5.25in floppy disc drive. Access speed of the hard discs is very high – 80ms for the 20Mb drive and 25ms for the 40Mb device. Memory can be expanded by the use of plug-in cards.

Prices start at £1,297 and go up to £2,183 for the VGA version. For an extra £345 you can have a model with a built-in 40Mb tape streamer. These devices usually cost around £700 and its due to Commodore's buying power that they are available at such a reduced price.

The soon to be released PC 60/40 and PC 60/80 are built around a 80386 CPU running at 8 or 16MHz. Ram starts at 2.5Mb and there are eight free expansion slots, two 32 bit, two XT and four AT.

Both machines have a 1.2Mb, 5.25in floppy disc drive, while the PC 60/80 also has a 1.44Mb, 3.5in floppy drive as standard – it's available as an extra on the PC 60/40. There are two serial and parallel ports as standard on both machines. Prices range from £2,068 to £4,138.

#### The future

Commodore is aiming to build on the strong brand loyalty found among its customers. In addition to keeping its existing customer base, it is also looking to expand into a new field — education.

Last year Commodore organised its first Education Exhibition at Middlesex Polytechnic's Bounds Green site. More such events are now being planned.

Among the exhibitors were Arnor, Corinth, with its new school administration package, Cad-Vision, Precision Software — showing a spreadsheet package for its Superbase — and HB Marketing.

Peter Talbot, Commodore's national sales manager, said of the event: "I was delighted both with the turnout and the calibre of the people attending our show. This is definitely going to become an annual event.

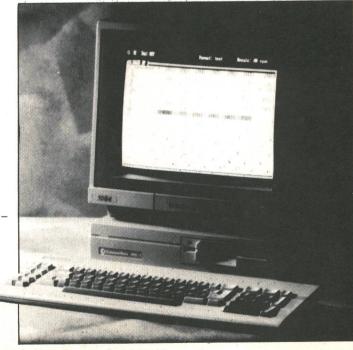
"Our 1988 education initiative has seen Commodore making major inroads on the education market. 1989 will be even better", he added.

A series of roadshows started in February this year to follow up on the success of the exhibition.

Reviews of all Commodore's new PCs will be featured in PC in coming issues.



Steve Franklin, managing director of Commodore UK: "I want to put Commodore back" into its historical position as the number one business computer"



The Commodore PC1 entry level machine



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TopDos will work with a network and supports the use of a mouse. It is at home with any version of Dos from 2.0 to 3.3 – and if you don't like the default colours they can be customised.

"Because it has been written entirely in machine code, Topdos is extremely fast and takes up only 40k of ram. If you are unhappy with MSdos and don't want to use Gem, Topdos is the ideal intermediary". – Terry Ashwell, PCA

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## DON'T CATCH A COLD

A virus in computer terminology can mean a lot more than two days off work while you recover. However, you can take suitable precautions, as Roman Iwaschkin reports

MANY of us seem to be worried about catching a computer virus. However, since no one other than Alan Solomon seems to have actually seen one, it's all too easy to get complacent and careless. It can't happen here, we tell ourselves.

We forget about taking elementary and obvious precautions – remember, no virus can get into your system unless you let it – and we lay ourselves wide open to catching one of these unwanted bugs. And that's just what the authors of these viruses want us to do. Make no mistake about it, someone, somewhere is writing one of those nasties right now.

So how do you protect yourself? First, use some common sense. Never boot from an unknown disc and never run any new program without first having a good look at just what is on the disc. Checking the directory will show up most of the files on the disc. TYPE all batch files — those with .BAT in their names — to see what they do.

Make copies of all your important program and system discs from clean, write-protected originals and do it while they are known to be clean. And always write-protect any disc that you don't need to write to. Most viruses and Trojans attack your system files and COMMAND.COM. Regularly refreshing them from the original Dos disc — using the SYS command then copying COMMAND.COM across — will

#### Viruses and Trojans

Viruses are programs which attempt to do damage to other programs or data covertly. Their most common effect is to format your disc so that you lose all your files.

Trojans masquerade as something useful, while at the same time damaging your disc. Their effects may not be obvious until much later, by which time it is too late to either identify the cause or to take remedial action. Anti-virus is effective against both viruses and Trojans.

kill off anything lurking there.

Never use your original discs to work with. Be careful about where you acquire your programs, particularly if they are shareware or public domain from bulletin boards — or even friends. It's just not worth saving a pound or two if it puts your entire system at risk. None of the more reputable shareware distributors will tolerate dubious material in their libraries.

To do their dirty deeds, viruses have to be able to write themselves on to your discs and alter your system files. If they can't do that, they can't do anything. What we need is something which lets us detect any hidden messages lurking deep within a program, something to stop a

virus writing itself to our discs and something that warns us if anything has been altered that shouldn't have been.

KAJP Software's new Anti-virus package does all this and more. It works on either floppy or hard disc systems, but bear in mind, no program can give you 100 per cent protection against viruses — a point which Keith Parkins, author of the package, is honest enough to admit.

Even better, it's shareware, so you can try before you buy. I've been testing Antivirus for quite a while and have no hesitation in saying that it's the only thing I've seen so far which even approaches any useful level of protection.

In fact, if you care about keeping viruses out, you should get the package without delay. It costs £5 including postage — a negligible amount, particularly when compared to the time you will have to spend trying to recover from a viral attack.

So what do you get for your money? Anti-virus consists of three main programs:

- SCAN automatically looks through a file to reveal any Ascii messages hidden within. Any crowing messages such as the notorious Arf, Arf, Gotchal are made immediately obvious.
- VIGILANT generates a fingerprint reference for important files and warns you if any unauthorised changes have been made
- SENTINEL is memory-resident and prevents any unauthorised attempts to write anything to a disc. No unexpected formats, alterations or any chance of a virus sneaking on to your disc.

Not strictly part of the above three programs, but included as a free extra, is the useful Compare, which is for those whose versions of MSdos don't include the Dos COMP utility.

As its name suggests, Compare checks two files for similarity then reports on any discrepancies and gives their locations. A disc sector editor can then be used to examine the differences.

# In use All the mo are easy ienced. To COMMAN enter:

All the modules in the Anti-virus package are easy to use, even for the inexperienced. To scan a non-text file such as COMMAND.COM all you have to do is enter:

SCAN filename

The program examines the entire file,

Turn to Page 46 ▶

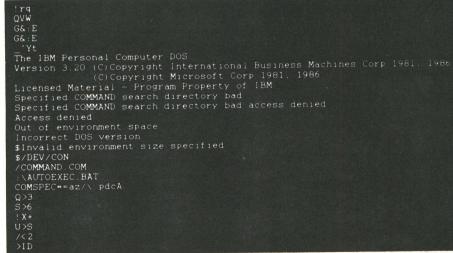


Figure 1: Scan finding Ascii text in COMMAND.COM

A write attempt is spotted by Sentinel

# A>sentinel SENTINEL is now watching over your system A>format b: Insert new diskette for grive B: and strike ENTER when ready Hea SENTINEL BIOS An attempt to FORMAT a disk has been foiled Hit any key to continue

A format operation is not allowed while Sentinel is in memory

#### **◄ From Page 45**

leaves out all the incomprehensible binary code, then outputs all the plain Ascii text contained within the file to your screen. Scan is extremely useful even if you are not looking for nasty messages, revealing all sorts of hidden details in an otherwise unreadable file — Figure I shows the result of a scan of COMMAND.COM.

Scan's output can be simultaneously sent to your printer by pressing Control+P.

Sentinel, by far the most important program in the set, works by intercepting any Dos calls — authorised or not — which will result in a disc format, file deletion, a write to a file or the changing of anything on the disc.

It is invoked by simply entering its name and, after informing you that *Sentinel is now watching over your system*, it disappears into the background. However, as soon as any attempt is made to access your disc a pop-up screen warns you of the fact and gives you the choice of continuing or aborting.

No choice is given with formatting attempts: Sentinel, with curt finality, reports: *An attempt to format a disc has been foiled.* Sentinel can be removed by entering REMSEN.

I tested Sentinel by every method I could think of: Writing to a disc with both a variety of word processors and editors as well as with several disc sector editors. I tried deleting files. I tried formatting discs. In every instance, Sentinel intercepted the attempt, and I could find no way to outwit

the program.

The warning screen appeared every time. Only by positively choosing to go ahead with a write to disc did Sentinel allow anything to pass its checkpoint. Any virus attempting to install itself on your disc is going to have to be extremely clever to get past.

No doubt someone will, sooner or later, break through, but Sentinel will certainly catch the vast majority of the current crop. Even if this should happen, running Vigilant periodically will detect even a successful attack.

The only thing which did defeat it was running PC Tools in its memory resident mode. Because Sentinel has to be loaded after any other memory resident utilities – so that Remsen can remove it without leaving a catastrophic hole in Dos – some conflict may arise with less well-behaved memory resident programs.

KAJP Software advises the removal of such programs when running unknown software under the protection of Sentinel. Nevertheless, this aspect cannot be regarded as a defect, since anyone using such utilities will be doing so quite deliberately.

The purpose of Sentinel is, after all, to guard against unexpected and unwanted interference with your system. KAJP Software says that if Anti-virus gets enough registrations from users, protection from memory-resident programs may also be added.

Vigilant operates by first producing a unique fingerprinting code for each file and storing this in a second file — VIGIL-

ANT.KRC. This is later used to check if anything has been altered in the protected file.

Any changes will be reported, even if only one bit — note, bit not byte — is different in the entire file, however long it is. Running Vigilant won't prevent any alterations by viruses,

but at least it will alert you that an attack has happened and find the cause of the problem. This measure will only be effective if it is used at the outset with a known clean copy of the program concerned.

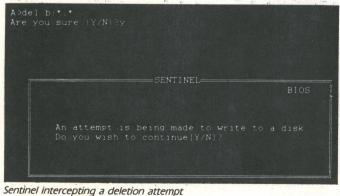
Of course, Anti-virus can't be - and



Compare finding differences in an altered file

doesn't claim to be — totally effective against each and every virus. Boot sector viruses will still be a risk, since they come into effect on starting your PC. But protection against boot sector viruses is a simple — never boot from an unknown disc and always write-protect any floppies — games for example — that do not need to be written to.

Nevertheless, the Anti-virus package is an effective weapon against most viral attacks. Should an infection still manage to get through, Anti-virus will at least help to slow its spread to other discs. Given this, it will soon be itself a major target for the virus writers.



▶ CHECKLIST
 ▶ Product: Anti-virus
 ▶ Price: £5 evaluation copy
 £15 personal registration
 £26 corporate registration
 ▶ Supplier: KAUP Software, 10 Church
 Road East, Farnborough, Hants
 GU14 6QJ.
 ▶ Tel: 0252 332955
 ▶ FOR: Provides a degree of protection
 against virus attack. An effective
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 ▶ AGAINST: Isn't fully automatic in
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LOOK through any PC magazine these days and you'll see dozens of companies offering IBM clones — to the point where the market must be reaching saturation.

A recent entrant into the PC arena is Brother, famous for typewriters, printers and sewing machines.

Its new range has two basic models: The BC-10 is an XT compatible, while the BC-20 conforms to the more advanced AT specification. The question is, do they have anything to make them stand out from the crowd?

On paper compared to my Amstrad PC1640 the answer appears to be no. With hands on, however, they seem a better prospect. In common with the Schneiders reviewed last month, straight from the box there is an impression of quality – everything looks solid and well made.

#### The look and feel

Two major considerations when you've decided what specification of PC you need are the keyboard and display. They'll govern how comfortable you are in day-

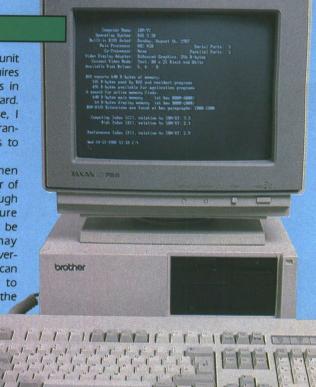
#### Brother BC-10

The XT-compatible's system unit has a steel case which requires the extraction of five screws in order to get inside to fit a card. Although I like a metal case, I prefer Amstrad's car boot arrangement which makes access to slots particularly easy.

A factor to consider when choosing a PC is the number of free expansion slots. Although your expectations for future hardware additions may not be great now, your ideas may change once you find how versatile a PC with a few cards can be. So it makes sense not to restrict the potential from the outset – the drawback

of such machines as the Schneider Euro and Olivetti Prodest to name but two.

The BC-10 has four full-length slots. On the



Brother BC-10: XT power with a quality feel

## BROTHERS AT ARMS

to-day use, and in these areas both BCs are first class.

I rate the German-made keyboard equal with the best I've used. With a quality feel and a pleasantly firm response, it's a pleasure to work on.

On the display front both machines were fitted with an EGA card driving a Taxan Super Vision 765 monitor. Production EGA models will have the same monitor but with a Brother badge. The display is a slight improvement on Amstrad's ECD equivalent, and with the etched anti-glare screen and swivel-and-tilt base this too, scores well for extended use.

Ouality ring-bound manuals for GW-Basic and MSdos are supplied, plus a guide to the machines themselves. These are good enough as reference works, but aren't too helpful if you are a computing novice in need of a tutorial. That's a complaint common to most manufacturers, and what you get with the Brothers is as good as you'll get anywhere and better than many.

review machine one was occupied by the hard disc controller and another by the EGA card. This left two slots, which is one less than a similarly equipped Amstrad PC1640. With a CGA or mono machine there'd be an extra free slot, and one more still if you don't go for the hard disc.

The microprocessor in charge of operations is a V20 running at 8MHz. This is NEC's version of the 8088 which performs certain operations faster than the original. Amstrad fits an 8086 processor, also driven at 8MHz.

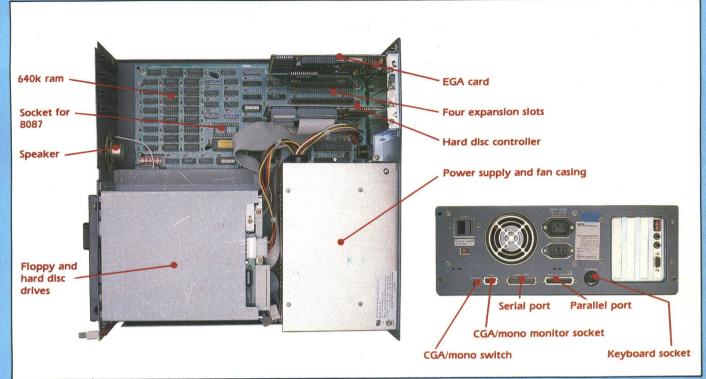
An 8086 performs faster than a standard 8088 when both are run at the same clock speed, but the V20 seems

Ian Sharpe meets two new clones and finds quality – at a price



Brother BC-20 AT compatible

#### EVIEW



Lifting the BC-10's lid reveals neat construction and four expansion slots

to turn the tables. Norton Utilities speed index — by no means a definitive test of real life computing power — is 1.6 for the Amstrad (1.9 computing index, 1.0 hard disc) and 2.8 for the Brother (3.3/2.0).

I didn't run any benchmark tests other than Norton's, but going straight from an Amstrad to the BC-10 it did seem quicker more so in some areas than others though on average not as much as Norton would suggest.

This is probably because the 8086 deals with memory in bigger units of data, so doesn't need to spend as much time waiting for information to transfer when more than one byte is involved.

A full complement of 640k ram is fitted, and if you go in for heavy number crunching there is room for an 8087 maths co-processor. The review machine was fitted with a 20Mb hard disc which was noticeably faster than the Amstrad's. By the time you read this a 40Mb version will be available, too.

Finally there is a battery-backed clock and calendar which is re-charged by the machine's power supply. With an Amstrad you have to put four dry cells in every year – not a major point, but a nice touch.

I find the Brother BC-10 hard to criticise other than I would have liked a speaker volume control, and at this price I would expect to see a mouse at the very least or some applications software — or both. My own feeling is that the overall quality

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#### WHAT'S IN A CPU?

Here and in other issues of *PC* we've referred to various types of microprocessor — 8088, 8086, 80286 and 80386 — so what's the difference between them? The original IBM XT had an Intel 8088 microprocessor running at 4.77Mhz. This processor does internal calculations in 16 bit quantities — that is it deals with numbers up to 16 binary digits long. When transferring data to and from memory, however, it does it eight bits at a time, meaning that every 16 bit unit of data has to be transferred in two goes.

An 8086 processor works the same way internally, but can transfer data 16 bits at a time. This gives it an automatic speed advantage over an 8088. The Japanese electronics giant NEC produces replacements for the 8088 and 8086 – the V20 and V30. By virtue of more efficient design these can run up to 30 per cent faster than the Intels on some operations.

The next step up in the power stakes – apart from the rarely seen 80186 – is the Intel 80286. IBM first used this in its AT (advanced technology) machine. This is capable of running like a very efficient 8086 making it compatible with ordinary software, but also in special modes of its own. I won't describe the special modes as a full explanation would get a bit involved, but will just say that the new operating system OS/2 needs the 80286's special capabilities as a minimum requirement. This is an important point if you're

thinking of upgrading in the future. For ordinary MSdos use, an 80286 brings extra speed owing to more efficient running and usually a higher clock speed.

Intel's 80386 came after the 80286 and is more powerful still. It'll do everything the others do – and faster – plus further enhancements such as the ability to use more memory and operate as several 8086s in parallel. It is a 32 bit processor, which means it can deal with data in even bigger dollops, and therefore shunt information around more quickly.

Recently a hybrid version, the 80386SX, appeared on the market. It is an 80386 internally but externally looks like an 80286. This is likely to replace the 80286 as it can be built into a computer using the same technology as 80286 machines, but brings speed and future-proofing advantages. Intel has an 80486 processor on the stocks which should appear this year. In the meantime we can look forward to the later technology coming down in price and the eventual disappearance of the older and less powerful CPUs.

Things move so quickly in the computer world that the microprocessor is not the whole story when assessing how powerful or fast a machine will be. Added factors are clock speeds, wait states, maths coprocessors, the NEAT chip set and micro channel architecture. Write in if you'd like the subject expanded into a full article.

#### Specifications at a glance

	BC-10	BC-20	
Processor	NEC V20	Intel 80286	
Clock speed	5.5 or 8MHz	8 or 10MHz	
Ram	640k	1Mb	
Power Supply	130W	130W	
Free expansion slots	4 x 8 bit	1 x 8 bit 3 x 16 bit	
CPU dimensions	367Wx390Dx135mm 1387Wx404Dx155m		
Interfaces	1 x parallel 1 x serial		
Keyboard	Extended AT compatible 102 keys		

#### **Prices**

	BC-10	BC-20
Single floppy	£799.25	£1,454.75
Dual floppy	£948.75	£1,546.75
Single floppy + 20mb hard disc	£1,144.25	£1,719.25
Single floppy + 40mb hard disc	£1,454.75	£2,064.25

Prices exclude monitor.

Monitors		
12in amber or green	£97.75	
14in colour	£419.75	
EGA card	£178.25	

#### **◄ From Page 53**

compensates for the lack of extra inducements, but of course the price/quality equation is between you and your budget.

I was sorry to see the review machine go back and I preferred it to my PC1640. It is quick, has a good specification, is well built, and is comfortable in use. There is the added security of dealing with a household name, and before deciding which XT-compatible to go for I recommend you take a look at this one.

#### **Brother BC-20**

If an XT hasn't the muscle for your spreadsheet, DTP package or whatever, the next step up is an AT-compatible equipped with a more powerful microprocessor. The BC-20 is Brother's contender in an area which, like the XTs have done over the last couple of years, is becoming cheaper and therefore more accessible to larger numbers of people at the base of the PC market pyramid.

Case construction is along similar lines to the BC-10, but is deeper to accommodate up to three drives. Ours had a 1.2Mb floppy (XTs have 360k units) and a 20Mb hard disc. As with the BC-10, a 40Mb version will soon be available.

The review model was fitted with 1024k of ram. MSdos can only use 640k, so when a PC has extra memory it is usual to have 640k for Dos and the rest as a ram disc.

Referring to the Brother's manual I could only configure the BC-20 for 512k main memory plus 512k extended. This is unusual and two phone calls to Brother brought conflicting reports on whether a normal 640k/384k setup is possible. This needs sorting out – over to you Brother.

When the system boots up and you start running your favourite applications program, the main thing you notice is an increase in speed over an XT. As a rough comparison, the Norton speed index for the BC-20 is 7.4 - 9.8 computing and 2.7

hard disc. From a computing point of view this is approximately three times faster than the already-quick BC-10.

This sort of speed is a luxury for word processing, but can make all the difference to hard task masters like Ventura. The power comes from the 80286 processor. It runs at 10MHz - or optionally 8MHz if things are a bit too racey – which isn't as fast as many competitors. 12MHz is by no means uncommon these days, and 16MHz and 20MHz machines are available from other manufacturers.

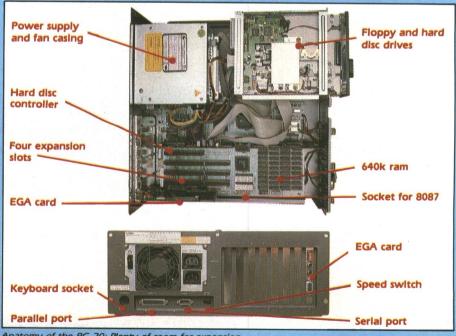
There's room for an 80287 maths coprocessor and there are six expansion slots. Two of these are 8 bit XT standard, one of which was taken up by the EGA card. The other four are 16 bit AT slots, though only three are available, as one houses the hard disc controller

Some of the competition may be faster, but like the BC-10, Brother's AT has a robust quality feel for which you may be prepared to pay extra provided the

memory allocation question is resolved. Long term reliability is not something I could test, but these machines certainly look as though they're made to last. As ever, you pays your money and takes your choice.

#### CHECKLIST

- Products: Brother BC-10, BC-20
- Prices: See panel
  - Supplier: Brother Computer Division, Shepley St., Audenshaw, Manchester M34 510
- Tel: 061-330 6531
  - FOR: Solid, well-specified machines. Very comfortable to use, wellknown manufacturer
- AGAINST: A speaker volume control and some bundled applications would've been nice. The AT's at the slower end of the market these days.



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#### O ORDER, PLEASE USE THE FORM ON PAGE 125

#### EATURE

## TAKE A ROUND TRIP TO THE

IN the last instalment we were using GOTO to make programs run in loops. Now in some quarters this would be a sackable offence, so we'd better find ways of keeping out of trouble. Here is a program similar to one of last month's examples:

#include <stdio.h>
main()
{
int c;

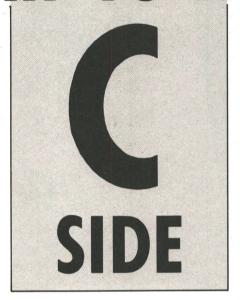
start:
 c=getche();
 if( c != 'F' )
 goto start;
}

This routine keeps taking characters from the keyboard until you enter an F, at which point it drops out of the loop and terminates. The following version introduces one of C's loop structures — WHII F

WHILE loops are not unlike the IF statements we used last time. With IF, if the condition inside the brackets is true the single statement after them is executed. It's the same with WHILE, but afterwards instead of the program continuing it jumps back to the WHILE and does the test inside the brackets again. If it's still true, the statement is executed again. If the condition is now false, the following instruction is skipped and the loop ends.

You can see, therefore, that the example will keep looping through the **c**=**getche()** statement as long as *c* doesn't hold the character F. When *c* does hold F, the condition is false and execution skips the statement to continue with the rest of the program.

This simple example highlights a problem: When you declare the variable *c* without initialising it with a value, at the start of the program it holds a random number. What if this number happens to be the Ascii value of F? The WHILE condition will immediately be false, and the **getche** will be skipped. This could result in a bug which would be difficult to spot.



#### In part three of his series on programming in C Ian Sharpe loops the loop and tackles a case study

How about setting c to zero immediately before the start of the WHILE loop? Yes, that would work, but there are more elegant ways of doing it. Here's the first of them:

while( ( c=getche() ) != 'F' );

Horrible, isn't it? I've put the spaces in for clarity by the way, they aren't needed by the compiler. The I= 'F' part is the same; all that's changed is that c=getche() has been taken into the brackets. When program execution reaches the WHILE, it goes through the following sequence:

- Examine the contents of the brackets.
- If there is anything in there which needs working out or executing before the condition can be tested, do it.
- Test the condition and act accordingly depending on whether it's true or false.

From this you can see that before the truth of the condition can be evaluated, c=getche() must be executed and c will be provided with some keyboard input

before a test takes place. Once done, the whole expression can be thought of as possessing the value in *c*, which then becomes the thing which is compared to F.

Because the testing and execution are all taking place in the brackets, there's nothing to be done in the body of the loop. But something still has to be there so that any subsequent statement doesn't get executed instead. For this reason we follow with a semicolon to provide an empty statement.

The example assumes that we still need the character stored in *c* for use later in the program. If this is not the case, the expression can be further reduced like this:

while( getche() != 'F' )

which I think you'll agree looks much neater than our first effort. The semicolon can be on the same line as the WHILE if you like, but I think it looks clearer if you put it where I have.

Before looking at FOR loops, there are a couple more things to say about WHILE. Firstly, like IF, if you want more than one statement to be executed you need to lump them together within braces:

while( condition\_is\_true )
 {
 one\_function();
 another();
 }

Secondly, the WHILE loop tests the condition before it does anything. There is a related but less commonly used DO...WHILE construction which executes the loop body before the test is made. This would provide another solution to our problem as the statement is executed — and c primed — before the loop condition is assessed:

do c=getche(); while ( c != 'F' );

Again, if you want more than one statement in the loop, enclose them in braces. In this case, DO...WHILE is not the shortest solution but it's as well to be aware of the possibility.

Of far more use is the FOR loop. Although it works in a similar way to a

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#### EATURE

#### **◄ From Page 57**

Basic FOR...NEXT, it's a bit more versatile. Let's start with a comparison between the C and Basic equivalents to print the numbers 0–9:

```
5 REM First in Basic
10 FOR i=0 TO 9
20 PRINT"Loop counter=";i
30 NEXT

/* And now in C */
#include <stdio.h>
main()
{
  int i;
    for(i=0; i<=9; i++)
        printf("Loop counter=%d\n",i);
}</pre>
```

The brackets after a FOR always contain three elements separated by semicolons. Our example is going to execute 10 times starting with a value of zero and ending with nine. The program keeps track of where it's up to by referring to a variable known as the loop counter, in this case *i*.

First in the brackets comes the loop's starting condition, and here we've set *i* to zero. The middle element defines what condition must hold true for the loop to continue executing at each cycle. This is exactly the same as what you find after WHILE, and you can think of FOR as an extended WHILE construction.

Here we've said that the loop must continue while i is less than or equal to nine. If i becomes 10 - as it eventually will – the condition becomes false and the loop halts. Incidentally, <= isn't the only comparison you can use; i<10 and i|=10 would have the same overall result.

Finally in the parentheses is something which happens every loop cycle. In this example we've specified that *i* will be incremented – increased by one – every time round. As with the other program control structures we've been learning about, while the loop keeps cycling it executes the single statement after it, and if you want more you put them in braces.

FOR loops can be a lot more complicated than the simple example shown above, so we'll investigate further. The first item in the parentheses – the one which sets up the initial loop condition – can have more than one element separated by commas:

In Basic you can add an extra command to FOR...NEXT loops — STEP. So, if we

wanted to count up in twos, the loop would look like this:

```
10 FOR i=0 TO 9 STEP 2
20 PRINT"Loop counter=";i
30 NEXT
```

which would print out 0, 2, 4, and so on. To get the same effect in C we change the i++ to i+=2. Remember that this is a shorthand way of saying i=i+2, and will add two to the counter each time round the loop. Now there's no rule to say that this item in the parentheses must refer to a loop counter — it must simply be something which can be executed, even an empty statement. Therefore, the following are all legal and do the same job:

```
for( i=0; i<=9; i++ )
    printf("%d\n",i);

for( i=0; i<=9; )
    printf("%d\n",i++);

for( i=0; i<=9; printf("%d\n",i++) )
    ;
</pre>
```

The first one is the form we've used so far. Following it comes a version where the executable statement is empty. If we didn't take some other measure to increase the value of the loop counter, the loop would execute ad infinitum because the condition i <= 9 would always be true. In the **printf** the increment operator ++ has been used after i, so every time that function executes i is incremented.

This second version has only one statement in the body; there's a gap for a statement in the brackets, so it's OK to rearrange it to give us the third variation. The loop body is now empty, and all the work's done in the parentheses — both incrementing the counter and printing its value.

Going back to our keyboard routine, we can now see the following possibilities:

```
for( c=0 ; c != 'F' ; )
    c=getche();

for( c=0 ; c != 'F' ; c=getche() )
;;

for( ; getche() != 'F' ; )
    ; /* Same as a WHILE */

for( ; (c=getche()) != 'F' ; )
    ; /* ditto */
```

In the first two, FOR's initialisation facility has been used to set c to zero before anything is done. Can you see why this is necessary, and why it isn't needed in the other two?

Right, it's time to put some of what we've learnt into a practical context. I had a submission recently where the author had included the C source code for his program. C is usually mostly written in lower case letters, but this chap had done the entire program in upper case. A few



minutes work with Zortech C and I had a utility written to convert every character in a file into lower case:

If you look at the Ascii character set, it's noticeable that the value of a lower case letter is 32 more than its upper case equivalent. What we need to do is look at every character in the file and, if it lies between A and Z, add 32 to it. In this way 65 – the code for A – becomes 97, which is the letter a.

As we're not up to file handling yet, this program uses the MSdos redirection facility to take input from a file instead of the keyboard and output to another file instead of the screen. This means you can test the routine using keyboard input and screen output, then when you're satisfied, let it loose on a disc file. Have a look at the Using redirection panel if you haven't come across this before.

The technique used here is to copy the contents of the source file into a destination file. This is done a character at a time, the character being read into c. The value in c is tested to see if it lies between A and Z. If it does, 32 is added to its value before the character is output.

Reading the characters and processing them is accomplished in a WHILE loop.

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#### EATURE

#### **◄ From Page 59**

Given that the standard input and output streams have been redirected to act with files, how does the program decide when it has got to the end of the file being processed? Well, when you get to the end of a file and try to read from it you get a special character called the end-of-file marker – EOF for short. We don't need to know what this character number is, because in STDIO.H it is #defined as EOF.

If you look at the WHILE statement you can see that it will get input into *c* while the character is not EOF. When EOF is encountered, the condition becomes false, the loop terminates and the program ends.

The IF statement is the bit which tests whether or not the character needs 32 adding to it. So far we've only used a single test within the parentheses, but here there are two conditions which must both be true if the bracketed expression as a whole is to be true.

If you look back to last month's article, you'll see that && means and. So, the IF condition reads: "If c is A or greater, AND if c is Z or less, add 32 to it." The brackets around the two sub-conditions are there for clarity, and you can omit them without doing any harm.

Lastly, *c* is sent to the standard output — usually the screen but, when redirected from the MSdos command line, to a file instead. Call the listing TOLOWER.C and compile it. It will become TOLOWER.EXE and you can test it using the keyboard and screen. In other words, just type TOLOWER without any filenames or if you're using Zed press Return after compilation.

All the upper case characters you type will be converted to lower case. You can generate an EOF character to terminate the program with Control+Z. Now try it on a file, and see if you can write the program TOUPPER which has the opposite effect.

#### **Further refinements**

The technique we've used here is perfectly valid, but parts of the program duplicate standard library functions which can be used to make the whole thing shorter and easier to read.

The IF line which tests whether the character is upper case can be replaced with:

isupper is in STDIO.H, and when passed a

character will return a value in the same way that **getchar** does. If the character wasn't in the range A to Z, you get zero back. If it was in range — an upper case character — a non-zero value is returned. From this you can see that the IF condition is making the same test as before.

Making a character lower case is another function which is supplied as standard equipment. The statement after the IF line can be changed to:

#### c=tolower(c);

You're probably becoming familiar enough with C to guess that **tolower** converts a character passed to it into lower case, and here we're putting the result of the conversion back into the variable c. It probably won't surprise you to learn that if you want to make characters into upper case, there is an equivalent function **toupper**.

Using **tolower** brings a further possible refinement. The function is designed to convert upper case into lower, but if you pass a character which isn't upper case it takes no action. This allows us to dispense with the IF line because any character passed to **tolower** will only be converted

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#### Using the #DEFINE directive

Imagine you are writing a program which requires the user to input a number between 1 and 11, such as in a menu selection. When the program is complete you decide to add a further option to the menu meaning that you have to change all references to 11 options to 12.

There may be several points in the program where the number 11 is used to refer to the number of items in the menu, and changing them manually could lead to mistakes — 11s missed or 11s not referring to the menu options changed in error.

To avoid this sort of hassle in Basic you might assign the value 11 to a variable *maxoptions* at the start of the program. Then you'd use *maxoptions* instead of 11 throughout the program. If a change was required at a later date, all you'd have to do would be to change the value of the variable at the start of the program.

You can do the same in C, but there is another feature of the language which is more suitable. The drawbacks of using a variable are that it takes up room in the program which is not needed as a variable — the value is never altered during execution. Also, during execution finding where in

memory the variable lives and getting the number out of it will be slower than using a constant value.

There is an instruction #define which isn't part of the C language as such, but a directive to the compiler. It allows you to define a string of one or more characters as meaning something else, for instance:

#### #define MAXOPTIONS 11

Wherever you would have used 11 in the program, you'd now use MAXOPTIONS like this:

if( c > 11)
 printf("Too big!\n);
/\* Becomes ... \*/
if( c > MAXOPTIONS )
 printf("Too big!\n);

During compilation every time the compiler comes across MAXOPTIONS it will substitute 11. Now if the number of options on the menu changes, all you need to do with respect to altering references to 11 is alter the #define line and recompile the program. It is very important to realise that MAXOPTIONS is not a variable; its value cannot

be changed by the program. #define acts on your source code like a search-and-replace MAXOPTIONS for 11 in a word processor. The only difference is that it doesn't actually alter your text file.

**#define** can be used in more versatile ways than just making number or character constants — you can assign complete strings:

#### #define BEEP putchar(7)

Character seven is a standard Ascii code which, when output, produces a beep from the speaker. From then on you could use:

BEEP;

in your program as if it were a command or function, which makes your program a lot more meaningful while cutting down on the amount of typing. During compilation all **BEEPs** will be read as **putchar(7)**s as if you'd put them there in the first place.

It's better to put the new character string in capitals so it stands out for what it is, and it's also better not to include semicolons in the #define but put them in their normal place in the program.





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#### ◆ From Page 60

if it needs to be, and left unmolested otherwise.

The body of the program now becomes:

while ( (c=getchar()) != EOF ) tolower(c): putchar(c);

But that's not all we can do to cut it down. Using a method we met earlier it can be condensed to:

> while ( (c=getchar()) != EOF ) putchar( tolower(c) );

or even:

while( putchar(tolower(getchar())) != FOF)

which eliminates c and makes the utility a one-liner (we had to wrap it round to make it fit the column) at the price of being difficult to work out what it does.

The outer of the nested functions putchar() - returns the value it just wrote which is what the WHILE tests against EOF. The written value is whatever getchar() came up with converted to lower case by tolower().

Next month we'll look at further

examples using FOR, WHILE and IF. We'll also see how you can start building your own function library, and expand our knowledge of variables.

#### Using redirection

MSdos has a useful facility to redirect input and output. What this means is that a program which would normally send information to the screen can be made to send it to another output device instead. This might be the printer, the serial port, or a file. Likewise, a program which takes its input from the keyboard can be fooled into taking the characters from another source - such as a file

The best way to illustrate these is by example. The DIR command normally sends output to the screen. To redirect it to the printer, you'd use it like this:

dir > lpt1

LPT1 is a special filename which MSdos takes to be the first printer port. If you wanted to record the disc directory in a file, you'd say:

dir > filename

filename would be created on the disc, and what would normally have one to the screen would have been put in the file instead.

Similarly, if you have a program which asks you three questions before it will do something, you can put the answers to the questions in a file - say filename again – and invoke it like this:

program < filename

As you'll gather from the examples, the < and > characters act as direction arrows forcing output or input in the direction they point. If this sounds useful, have a closer look in your manual and investigate the >> and I operators which are related.



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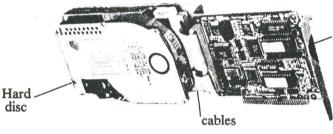
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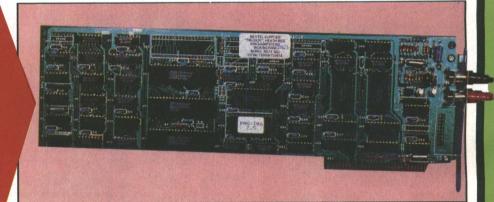
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IN this series I have argued that the popularising of computer-aided draughting and design marks a change in kind, not of degree. At one end of the spectrum it has transformed the way we practice design; at the other it has plugged design into an international communication network, the significance of which is only now beginning to be understood.

Within the boundaries of design, CAD's effect is likely to be more profound than that of the word processor on ordinary communication. Computers can be regarded as either the evolutionary response to growing complexity, its principal generator, or both. Whichever it is, in CAD terms the labyrinthine array of choices now available to designers makes its use almost indispensable.

For many years mainframes and minicomputers have set the pace. No large company involved in any kind of design could afford to be without one; no widely available products, from cars to aeroplanes, from calculators to microwaves, or from prefabs to hypermarkets have been designed without it being used at some stage.

But it is now the desktop computer to which the enlightened are turning – the affordable, understandable, almost chummy box through which near miracles of design are created by people who only months earlier had never laid a finger on a keyboard.

It isn't just that those people are so easily translating manual draughting and design skills from drawing board to computer which is so surprising, it is their almost immediate perception and exploitation of the computer's power to transform the certainty of their designs.

#### Costs steadying

When examining the scope of computeraided design, it is easy to judge it simply as the electronic equivalent of manual draughting. It is — or should be — nothing of the sort. Today's desktop computer has revolutionised almost everything connected with design. Tomorrow it will perform unimaginably, and looking at just one or two trends will show why.

The drop in cost from early mainframes to the modern PC has been remarkable. To claim that the nadir has been reached would be brave, but there are signs that there is 'unlikely to be much further downward movement in hardware costs. Software is another matter, and you can safely predict that competition will force prices down. But, in all, the cost of getting into serious CAD isn't going to change significantly.

What will change though, is what you

will get for your money — greater speed, more memory and significantly larger disc capacity. The inexorable trend towards the instant and the infinite will, if anything, accelerate. You will find higher definition, multi-coloured screens the norm and, complementarily, output devices will be able to handle full solid shaded colour as standard. It is hard to foresee any major improvement in the mouse, but full colour affordable scanners can't be too far away.

#### Workstations

Few people can escape the notion of a workstation when they start looking at CAD. The word is now used so much as to be almost meaningless. After all, any point at which you practice design – or anything else, for that matter – is a workstation.

What I think the promoters of the word mean is an integrated collection of hardware, designed and assembled purely as a design tool, not as is generally the case, a loose assortment of general purpose devices. That makes a lot of sense, and the future of CAD seems destined to follow that route. But it may not be the best one. More often than not, the tidiness of a workstation can be out-performed substantially by the judicious choice of disparately sourced hardware.

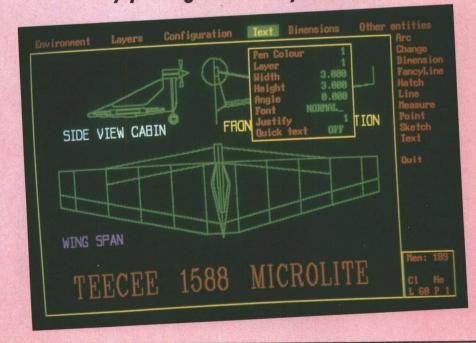
My PCW8256, which I have grown to love over the last two years, is a workstation of sorts, but I have to admit that the cobbling together of my IBM compatible, an Epson LO-500 and proprietary word processing software produces better results, if not so conveniently.

That said, I suspect many users of CAD will opt for the comfort and convenience of packaged workstations as they become more widely available and versatile. But no CAD system can be judged without its hard copy output device. Pen plotters dominate currently, and it seems probable that this will continue for some time. But pen plotters aren't too clever at producing full-colour solid images — although, accepting the colour limitations imposed

Turn to Page 68 ▶

## THE FUTURE IS YOUR DESKTOP

Harry Atherton rounds off his CAD series by peering into his crystal ball



#### **◄ From Page 67**

by pen availability, it isn't an impossibility. There are now a number of ways of producing solid, highlighted and shaded colour images as direct output from computer-generated designs — including digitised ''photographs'' of screen-displayed images. Each is expensive relative to the cost of other CAD hardware, but costs should fall dramatically within the next two years.

The motivation to get prices down is strong. The real power of computers in design is that they have the potential to produce images in the way we see the real thing – three dimensionally, and in colour. Traditionally generated drawings are restricted by the tools available to the draughter, mostly confining output to the kind of orthographic projections associated with the blueprint.

Computers are unfettered by such conventions and will force the hard copy presentation of drawings to be "real" and instantly understandable. You only have to look at televised computer graphics to see how close to reality it all is. Speed, computer power, memory and storage capacity are all essential to this kind of performance.

If I had harboured any doubts about the imminence of the change, they were dispelled last week. Like a child in a toy shop, I had hands-on experience of a 386 machine with a fast, high-capacity hard disc and a maths co-processor. Hidden line removal which, on my ageing XT-

compatible had taken over half an hour, took less that two minutes.

Fragmented is perhaps the best word to use when looking at CAD software. There is very wide choice in both scope and cost — often tantalisingly difficult to separate in performance. The reasons for choosing software were covered in an earlier article; it is to the future of software that I now address.

#### Software

The most certain – and perhaps most obvious – trend will be towards the integration of 2D and 3D software. For too long – and with good reason, it has to be said – the two have been separated, but the larger software houses in the UK Robocom and Autodesk for example, already offer suites of linked software through which you can move your designs without hindrance.

While accepting this as a transitory move in the right direction, the complete integration of software seems a certainty, not just the coupling of straightforward 2D and 3D software, but solid modelling and analytical software too. In many ways it is this integration of software that more appropriately describes a workstation than does the configuration of the hardware.

Of all the progressive trends in CAD, none is likely to be as profound in its effect on the way we live and work as that of communication: It is hard to restrain your imagination.

At the engine room level, the local net-

working of computers in design is already well in train, and in the near future we will see a substantial change in pace as more people understand its potential. The social dimension of local networking will probably determine the shape of those networks. The need to reconcile man's independence as a designer with the corporate need to optimise the benefits of central databases and records.

A fully integrated stand-alone work-station linked to centralised data seems to be the answer. But it is when the national and international linking of such local networking cells is seriously attempted that the potential for the greatest gain — and strife — will become evident. The clash between the "not invented here" and the "let's not re-invent the wheel" schools of thought will really have their field day.

While I am mindful that I mustn't become carried away forecasting how society is likely to change through evolving technology, it seems pertinent to reflect on how communication devices might affect the working lives of large numbers of designers and draughters.

If you accept that there are now overpowering pressures which make working at home something to be desired, the advances in communication facilities will turn hope into reality for a lot of designers.

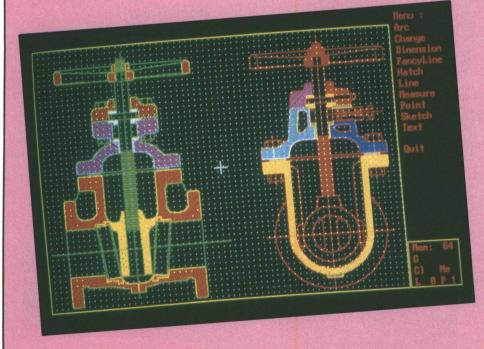
#### Major changes

When ISDN — Integrated Services Digital Network — is fully operational, outworking becomes an easily organised arrangement which can be integrated on-line with the centrally based facilities. Add a photocopier and a fax machine, and you have a full self-contained workstation.

While it is easy to run riot with what you see as the potential for present knowledge, I think there is enough evidence now to believe in two major and imminent changes which CAD will bring about: It will fundamentally change the presentation of design, and it will significantly alter work practices. Presentation will become real instead of solely representational. Secondly, designers and draughters will spend more of their time creatively, less on pure drudge.

Two messages, primarily for those who could use CAD but for one reason or another don't: Do so – the system you buy is less important than choosing to "join the club", there are many low-cost CAD packages which can be written off quickly.

Secondly, the tools of conventional draughting are becoming antiques — so start collecting now.



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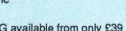
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# STROLL ROUND THE PUBLIC DOMAIN

The disc operating software on the PC is well known to be a hostile environment for the user. But salvation is at hand if you know where to look — as Don Bradbury explains

I BELIEVE I would be justified in hurling an accusation of masochism against the computer industry. If we, the end users, are not making things unnecessarily difficult for ourselves by our own ineptitude, then others are quick to arrange the difficulties for us.

I remember some years ago approaching that paragon of the computing establishment, the Epson Corporation, with what was to me at the time a perplexing question to do with escape codes. The printer's manual was not exactly the easiest document in the world to understand, at least not by a relative newcomer to computing.

After a brief exchange with one of their technical department boffins, he — being suitably unimpressed with my idiotic questions — said: "If we made it easy enough for everyone to understand, you'd all know as much as us".

See what I mean? There was I, in the very birth pangs of my computing career, and what was I confronted with? Jargon and obstruction from the informed. The death knell of many a budding hopeful, I suspect.

#### Operating systems

Of course, it wasn't and still isn't all down to the firmware establishment. Take, for instance, the interface — sorry, jargon again — which we all face, that of the disc operating system. You simply have to understand it, or at least someone you can turn to has to understand it, and once again you find the same things, unnecessary difficulties and perplexing experiences.

Consider the prime example of upgrading to the latest version of the operating system. Most of us feel we have to do this as new releases are put out to an unsuspecting public. Yet what do you find? Incompatibilities galore!

Systems you have run for years suddenly

report an incorrect version of Dos and unceremoniously dump you out to correct things and start again. New versions of COMMAND.COM mixing with old ones if you're not very careful, or worse, old versions over-writing new ones.

Then there's the vexing question of hidden Dos files. Is there any real virtue in hiding a system file? Oh, I know about them being undeletable and therefore it is presumed that they are safe.

#### Vanishing disc space

They are not revealed by a DIR search or TREE command, yet you need to know they are there and you need to know where they have been placed — if indeed they have been placed anywhere at all, since they are not transferred by the Copy command. I admit you can see them by using one of a number of utility programs, but Dos itself doesn't like you to see them or know where they are.

How silly. Protect these important files from the ignorant, by all means, but I think it is desirable to be let into the secrets of what is actually happening. In the April issue of *PCA* we had a letter from a computer user wanting to know where much of the disc space had vanished to on the system disc which had just been made.

It was the Dos hidden files which were responsible. They have to have the system bit set because this attribute determines their correct positioning on the disc, but I wish that the system attribute itself did not hide a file. Hiding a file should be the prerogative of the user, not Dos.

Take another example, the simple Disk-copy A: B: command. All Dos asks you to do to start the process is *Press any key to continue*. Well it's all too easy to do just that when reaching across the keyboard to insert the discs, and therefore before you are ready. Why not add a touch of protection by requesting that, say, the P key should be pressed. It would be easy to remember P for proceed, surely?

A more serious possibility is misuse of the FORMAT facility, as routine an operation as you could imagine, and yet so

Turn to Page 72 ▶

C:\MAGS								
TEST.DOC	51,043	bytes	9:29	am				
TGOLD.DOC	45,909	bytes	7:51	am	Tue	Aug	30	88
ART2.DOC	14,632	bytes	9:18	am	Tue	Oct	11	88
C:\PASCAL								
BINOBJ.DOC	4.855	bytes	4:00	am	Fri	Nov	20	87
CRT.DOC	2,565	bytes	4:00	am	Fri	Nov	20	87
DOS.DOC	3.577	bytes	4:00	am	Fri	Nov	20	87
GRAPH DOC		bytes	4:00	am	Fri	Nov	20	87
GRAPH3.DOC		bytes	4:00	am	Fri	Nov	20	87
PRINTER.DOC		bytes	4:00	am	Fri	Nov	20	87
SYSTEM.DOC	1.550	bytes	4:00	am	Fri	Nov	20	87
TURBO3.DOC		bytes	4:00		Fri	Nov	20	87
C:\QUICK								
FILELOCK.DOC	10,933	bytes	5:53	pm	Sat	Jun	13	87
README.DOC	27,007	bytes	4:11	pm	Tue	Jul	28	87
13 files found								

Selectively searching for files with WHEREIS

# EATURE

#### **◄** From Page 71

easy to apply unintentionally. I know there are limits to what you can expect the computer operator to do to carry out such a mundane task.

You cannot afford to make it too complicated. Yet I think that inexperienced operators could be protected by providing a batch file on the system disc, transferable as part of the SYS command, which would ensure that only a disc in drive A or B could be formatted. Even then only after a beep, an on screen prompt and a final request for confirmation.

This would protect drive C, one which is rarely formatted, and so it could be made a significantly more difficult task. For a start, only someone who knew what they were doing would be carrying out such a move normally, and they would be prepared, I believe, to go to a little trouble to carry out such an unusual operation.

#### Personal prompts

Surely the first thing everyone has to do when setting up a new hard disc is to tweak the system prompt so that they know where they are when changing directories. Nothing is more bemusing than to move to, say, a second level subdirectory, and still be faced with a bare C:> prompt from Dos. It's more than just a question of convenience. You could easily enter commands which would be inappropriate, or even disastrous, if you were in the wrong subdirectory.

There is no reason why the path could not be incorporated into the Dos prompt as standard. Instead you have to set it manually, using the Prompt command and adding \$p\$g or whatever is required. Flexibility would not be lost to those of you who want it, if the system then allowed further adjustment. Users of floppy disc only machines, who do not normally use subdirectories, would still have only an A:> or B:> prompt and all would be happy.

Then you have commands which are more difficult to memorise. I don't have much trouble remembering the spelling of CHKDSK, though I know many people who do. Still I type it in rather slowly to avoid being thrown out with a *Bad command or file name* retort from Dos. Why not just CHK or CK? Quicker, easier to remember, less error-prone, and I think still unambiguous.

You can, if you choose to, incorporate the CHKDSK command under a more easily remembered batch file name called say, CK.BAT or you could rename the original file with one of your own choosing.

You can, of course do this with any

- 1															
	ARNORE2	DCT	166k	_			153k	-	ARNORENG	QIK	2k	-		PTR	2k
	CITOH	SRC	3k	-	COMMAND	HLP	23k	è	CONFIG	EXE	73k	:	CONVERT	EXE	32k
	DIABLO	PTR	2k	:	DIABLO	SRC	2k	:	EPSLASER	PTR	2k	0	EPSLASER	SRC	4k
1	EPSON	PTR	2k	:	EPSON	SRC	3k	:	EPSON24	PTR	2k	:	EPSON24	SRC	1 K
1	FRED		1k	:	FROMASC	CVT	1k	:	FROMCPC	CVT	lk	:	FROMCPM	CVT	2k
	FROMWS	CVT	1k	:	IBM	PTR	2k	:	IBM	SRC	1k	:	JUK16100	PTR	2k
1	JUKI6100	SRC	1k	:	KYOCERA	PTR	2k	:	KYOCERA	SRC	4k	:	LASERJET	PTR	2k
	LASERJET	SRC	1k	:	LC10EPS	PTR	2k	:	LC10EPS	SRC	1k	:	LC10IBM	PTR	2k
1	LC10IBM	SRC	1k	:	LXBOO	PTR	2k	:	LXBOO	SRC	1 k	:	NECP1	PTR	2k
1	NECP1	SRC	1k	:	NECP2200	PTR	2k	:	NECP2200	SRC	5k	:	NECSPIN	PTR	2k
1	NECSPIN	SRC	1k	:	<b>OKI290</b>	PTR	2k	:	OKI290	SRC	4k	:	PROTEXT	BAT	1k
١	PROTEXT	CFG	2k	:	PROTEXT	EXE	227k	: 1	PROTEXTH	BAT	1k	:	QUENDATA	PTR	2k
1	QUENDATA	SRC	1k	:	QUME11	PTR	2k	:	QUME11	SRC	1k	:	SETPRINT	EXE	32k
١	SIMPLEUK	PTR	1k	:	SIMPLEUK	SRC	1k	:	STDDAISY	PTR	2k	:	STDDAISY	SRC	2k
١	TAXAN	PTR	2k	:	TAXAN	SRC	4k	:	TOASC		1k	:	TOCPM	CVT	2k
1	USER	BAK	1k	:	USER	DCT	2k	:	USER	OLD	1k	:	USER	UWF	1k
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١	C: Total	of 8	352k i	n	65 files	with	2234	k	space rem	naini	ng.				
1															

SDISK displays your directory in a wide, sorted format

lengthy Dos command. For instance, a batch file called simply D.BAT could be used to call the often used command DISK-COPY A: B: A file called FT.BAT would be more easily called than FORMAT B:, and FTS.BAT could be used for FORMAT B: ///S

With Dos 2.x, particularly, the last one would also provide a measure of protection from an accidental format of your hard disc. Just being required to enter FORMAT while logged on to drive C can prove fatal to the massive assemblage on your main data disc, the system blithely proceeding with your careless command.

Just be careful if you use them. For the Format command abbreviations, I think it wise to use more than a single letter to reduce the chance of a mistake.

Dos is notoriously deficient in its provision of utility programs. I'm thinking mainly of quick and easy ways to manage your data files and run hardware checks. You don't really want to have to resort to

#### Not so helpful

Some of the descriptions of Dos commands or facilities may well be a little difficult for the newcomer to grasp, but why make it worse with a confusing manual entry? Take, for example, the way in which IBM manages to describe the GRAFTABL command. It reads:

"Some text characters required for language (non U.S.) support in graphics modes are not initialised by BIOS at power on. GRAFTABL loads a table of data in memory which defines these characters and changes the interrupt vector (1FH) for the colour/graphics adapter to point to this table. This allows the Ascii characters 128 through 255 to be displayed when using the colour/graphics adapter."

Beautiful isn't it? It's calculated to make the first-time reader hastily pass on to the next page and worse, make him wish he didn't have to return to it!

Debug in order to simply reset a file's attributes, for example.

#### Add-on programs

And what about searching for a misplaced or duplicated file on a hard disc, reorganising your directory listing or checking for free ram or disc space — without using the relatively slow CHKDSK.

All of these, and many others besides, have to be carried out via add-on programs, notably from the public domain – altruistic enthusiasts giving us the benefit of their tricks of the trade, generally for free or at nominal cost.

Perhaps it's just as well when we have already shelled out a sizeable sum for our copy of Dos. You'd think that market pressures would soon force Microsoft and the like into a more congenial mood. Not a bit of it. It took until version three of MSdos to include a ram disc program in the system.

That problem was solved years ago for those who scrutinise the public domain offerings. I then used a program called MEMBRAIN.COM. I still do for that matter, because I simply haven't taken the time to switch to RAMDRIVE.SYS or VDISK.

It's on PCBBUK 23 — a volume in the Public Domain — and it costs next to nothing to acquire and evaluate if you're still on Dos 2.x. It's configurable to your requirements and is automatically assigned the next available drive letter. Thus if you have a twin floppy machine, the Membrain ram disc is recognised as drive C by the system.

As far as changing file attributes is concerned, there is a very nice offering on US2 698 called ALTER.COM which allows you very easily to change at will, any of the four file attributes. Using the simple syntax ALTER [d:] [Path] filename.ext /R would render the chosen file read only. That is, it would be made undeletable and not subject to modification. Very useful for material you particularly need to archive and protect from accidental change or



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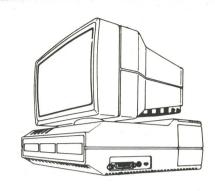


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#### **◄** From Page 72

removal.

Other options for this program include /S to confer the attributes of a system file like the two Dos system files. These particular files also have the hidden attribute which can be set for other files by using /H with ALTER.COM.

Since such files are not revealed by a DIR search or a TREE command, you might think that this is desirable to prevent prying eyes from snooping into them. However, it is easy, after a period of time, to forget that you set this attribute. You could spend a lot of time looking for the file, particularly if you forget its name.

To be able to list it again in a DIR search you have to reset the hidden attribute by entering the Alter command again, this time with a /N switch to restore normality to the file - that is switch all attributes off.

Another utility I value is also found on PCBBUK 23. This looks for those missing or duplicate files across a whole disc - and in every directory. It is called, memorably, WHEREIS.COM. You simply enter WHEREIS <filename> and off it goes to

carry out the search and then report the full path to every occurrence of the file on the disc.

There is yet another most useful program, again on the same PCBBUK 23 PD volume, called SDISK2.COM. This takes the directory of a floppy disc into ram, sorts it into alphabetical order then re-writes the file listing back to the directory. It's great if you have lots of files on the disc and makes it much easier to locate a particular file in a directory.

#### Value for money

The system files are left where Dos expects to find them during this process and other hidden or even deleted files are handled. The latter, not really deleted by a DEL <filename> until the space is over-written by subsequent disc writes, are placed at the end of the files list and kept in their deleted state.

A little 1k file called FREE.COM can be used to report on the amount of free space on the current disc. It's on PDBBUK 23 once again. There are a great many utilities in this volume. Others include a floppy disc drive cleaning utility - sets disc activation time and head movement - on screen clocks, a calendar program for any chosen year and a Dos level colour setting facility which is far easier to apply than through Dos itself

Volume US2 279 contains a program called RAMFREE COM to report, while in a Dos shell, the amount of memory you have left with your applications loaded.

I hope, by these few pointers, to have given you hope that you should not feel unduly limited by the undoubted deficiencies of Dos. Where the big boys left off the tiddlers have often continued. This applies in a much greater number of areas than you may imagine. Contact your favourite public domain supplier - see the advertisements in this and previous issues of PCA and ask him for a list of the volumes available

You should not expect to pay more than £5 or so for any volume. The genuine PD volumes are generally quite full - some contain up to 50 utility-type programs. These are very good value and can keep you active for many weeks investigating their potential.

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Three-Part Invention No. 12 in A Major

by J.S. Bach

→ = 130 Allegro



HOW much would you, as a PC owner, expect to pay for a scorewriter? The chances are you're thinking in hundreds of pounds rather than tens—unless you've skipped to the end to check out the price of this program. Only £87? Is it too good to be true? Let's see.

Separate programs are provided for use with a Hercules and CGA display and you need

256k of ram. A Midi interface is optional – and costs extra of course – and the program supports the standard Roland MPU-401, Voyetra (MPU-401 compatible) and Optronics.

Control is from a main menu with eight options. Operation is via the keyboard and function keys — sorry, mouse users. You can set the path name and list the directory. Any SongWright files will be picked out — nice.

There are two ways to get music into the system. The first is from the Record screen where you "play" the PC's key-

board. You don't play it in real-time by tapping a funcnote pitches one at a time.

Once the pitches are in you move to a screen showing a stave and enter the durations. This is done in real-time by tapping a function key each time you want a note to play. A similar

system, commonly known as tap time, is used in several single keyboards — the all-singing gizmos with automatic chords and rhythms. Notes can also be entered from a Midi keyboard.

A metronome beep keeps time while the note durations are drawn as horizontal bars across the stave as you play. The metronome speed can be altered but it bears no relation to a tempo in beats per minute. The default is 100 which is around 40 bpm and terribly slow. At faster speeds operation becomes erratic. This was the least successful and my least favourite method of note input.

Far better, in my opinion, is the Compose screen. Here you enter notes directly on to the stave. Each note has four attributes: Pitch, accidental, duration and link. Link is used to enter more notes on the same beat to produce chords and to form ties and slurs between notes.

During note entry the program remem-

orchestral-type scores.

The staves are a finite length, unlike some larger – and more expensive – score-writers which will happily keep adding bars to a stave until the piece is complete. This means that after entering about four bars you must manually move down to another stave.

You can enter

lyrics beneath the

notes and in Sing

mode they will be

printed on the

SOMETHING
screen in time with the bols entered above

screen in time with the tune. Chord symbols entered above the stave will be adjusted if you transpose the piece — very helpful.

During editing, you can play a line back through the PC. Monophonic lines are fine but the PC has to play play chords as arpeggios — notes played one after the other in rapid succession — an acceptable compromise.

In the Perform screen you can play back an entire score via Midi. You can allocate separate Midi channels to each of the two voices on up to eight staves. You can also

adjust the tempo on the fly from the playback screen but you don't get a running count of the new tempo — and it's not in beats per minute in any case. But worst of all, playback here is erratic too, the busy parts are terribly disjointed.

This is really rather a shame as Notation-to-Midi output would be superb. However, even many more expensive scorewriters don't offer Midi playback and considering the price, you may like to look upon SongWright mainly as a scorewriter and the Midi playback as a check rather than a performance.

The Edit screen shows eight staves on screen at once so you can see how the piece fits together. You can copy, cut and paste bars, save or load them to and from files enabling you to move music between

bers the attributes of the last-entered note and these can be repeated by pressing Return. You can also enter pitches from a Midi keyboard and then step through the durations on the screen — a sort of steptime tap time.

These facilities help speed up entry considerably, although I'm sure it would be

After word processors come music processors. Ian Waugh plays composer while the notable SongWright, from Computer Music Systems, keeps the score

possible to speed it up even more, perhaps by mapping durations on to Midi note numbers. You could then enter both pitch and duration from a Midi keyboard or be able to repeat the last chord entered.

You can include double bars, repeat bars, 1st, 2nd and 3rd time endings, accents, tenuto and fermata signs. You can also define your own symbols — using a word processor — and several extra symbols are included on the disc. The spacing between bars can be adjusted, too.

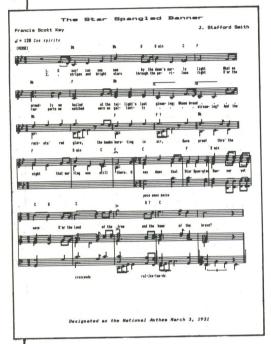
Each stave can have two parts — each containing chords — and staves can be joined together to produce piano and

Turn to Page 76 ▶

#### ◆ From Page 75

pieces. This allows you to build up a score from individual parts and vice versa.

The Edit module had an aversion to my



Yamaha PF70 electric piano and crashed when exiting to the menu. After much huffing and puffing - hi-tech talk for plugging and unplugging equipment - I believe the culprit to be the use of active sensing by the piano.

This is a signal some instruments transmit about three times a second to let other equipment know they're still there. If the signal stops a fault is assumed to have occurred and the unit switches off its voices. It can be useful for preventing the dreaded Midi drone.

But even if that is the cause, as I suspect, the program should ignore the messages and it should certainly not crash. However, active sensing is not terribly common although Yamaha seems quite fond of it.

Let's get to the bottom line - the printout. As you can see, it's really rather good, although the placement of one or two symbols - some of the triplets for example - could be better. The notes aren't beamed in the Composer but they can be beamed in the printout, although you don't have any say about the grouping.

The manual is sprinkled with humour and some terrible puns - if you're symbolminded - but the tutorial section is excellent if at times, a little condescending.

The main section could do with some expansion – it's basically a 10-page list of functions.

SongWright's price belies its power and versatility, even though it has several rough edges as far as scorewriters go. It would be ideal for the production of lead sheets in busker book format - tune, chord symbols and lyrics - and for the scoring of simple piano and orchestral parts - as long as you bear in mind its shortcomings.

It's main attraction is undoubtedly its price. If you're on a budget and your requirements aren't too demanding, do check it out.

# CHECKLIST

- Product: SongWright
- Supplier: Computer Music Systems, The Coach House, 6 Manor Road, Teddington, Middlesex, TW11 8BG.
- Tel: 01-977 4546
- FOR: Lots of impressive facilities for the price.
  - AGAINST: Playback via Midi erratic. Operation rather fiddly. Lacks sophistication in certain areas.

## How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,604 (the Whisper), the dearest £2,892 (the Cheetah). You will also need a separate telephone line, costing £101 to install, plus £404 a year rental. That's a total outlay over the first year of a minimum of £2,109. (All prices include VAT.)

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For further information please ring 0625 878888

# : TEVIEW

ACT - or Activity Control Technology is yet another computerised personal desktop organiser. Its resemblance to a filofax even extends to the manual, which comes in a deluxe skin-crawling canvas substitute. The distinguishing feature is a strong executive slant - ACT is aimed at businessmen rather than the average man in the street.

The various functions and elements of the program, such as pop-up calendar and calculator, are largely predictable but generally well done, and there are some original touches.

The heart of ACT consists of profiles of your business contacts. Among other things each profile records your contact's name, how to get in touch, their secretary's name, details of when you last spoke, the results of the contact, and a To do entry to record things you have to do as a consequence.

So a profile is a glorified address book, albeit not glorified enough to have more than five lines available for the address itself. My address has six lines, this magazine has eight and I have a growing conviction that programmers don't actually know anyone to write to. If they did, they would discover the simple social truth that five lines aren't enough!

As well as a fragment of the address you can store details of alternative contacts in the company. Other fields include the relationship they have with your organisation - for instance customer or supplier and how you made contact with each other. There are 15 user-definable data fields with between 12 and 60 characters which can hold customer account numbers, credit ratings, fax numbers and so on.

#### Pop-up convenience

Each profile can have optional free-form notes. These can be any length and are automatically date stamped and kept in order. Similarly changes to certain of the profile fields and optionally the userdefined ones are recorded. These become the history of the profile so you can have a record of correspondence, for example.

At every opportunity ACT uses pop-up

menus which have pre-set choices intended to save typing. For instance, there is a menu for the Results and To do options, with entries such as Arrange meeting or Ring back.

The menu which pops up if you are in a telephone number field will list some of the most common dialling codes. If you are in a field which expects a date, an option such as in five days will automatically insert the

The pop-up menus may be edited and you can create customised menus for the user-definable fields. This system has the incidental benefit of standardising the wording used so that data searches are more likely to be successful.

Searching for and selecting records is via the Lookup menu. Selection can be by geographical area, business type - if meetings are due - or any other criteria. Some of the profile fields are indexed for rapid response, but a keyword or part-word search can also be accomplished.

More complex searches are achieved by filling in a blank profile form which matches data in several fields at once. A search can be made for the first letters in an entry, an exact match, or to find all records with any data in the field. Boolean logic - AND, OR, NOT and so on operators such as >= are also available.

Records selected on one search can be

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While trying to bring his activities under control, Tony Kendle finds his PC being taken over

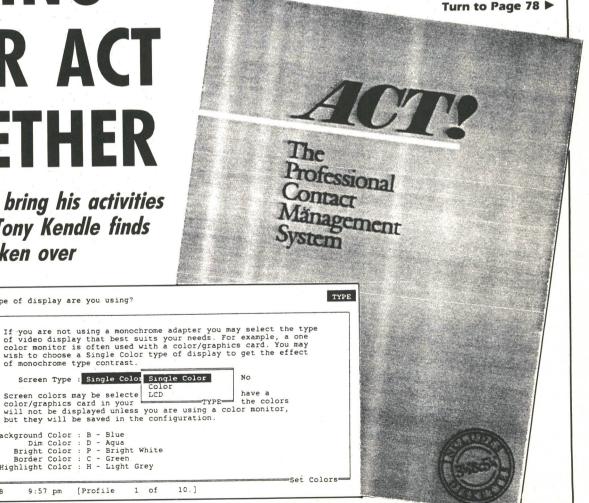
What type of display are you using?

Background Color : B - Blue
Dim Color : D - Aqua
Bright Color : P - Bright White
Border Color : C - Green
Menu Highlight Color : H - Light Grey

9:57 pm

[Profile

1 of



You can configure ACT to work with your system

1/11/88

# EVIEW

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added to or replaced by subsequent searches, and unwanted records are easily rejected. There is also an option to restore the results of the last search.

Complicated search and sort criteria can be saved for future use. If several profiles have been selected using the Lookup menu, data entered into a field in one will subsequently appear in all of them — useful for arranging group meetings.

Most of ACT's other functions automatically relate to the currently selected profile or profiles on the screen. An exception is the library. This is a fancy name for a general notepad which, according to the manual, can hold such things as inventory lists, company policies, product specifications and pricing information.

Other ACT elements include Expenses, which holds details of where and when the expenses were incurred, how much, miles travelled, time spent at meetings and so on. Again pop-up menus can be used which contain different types of expense and payment methods. A millometer will automatically calculate the expenses at a given rate per mile.

#### On the line

The Telephone option uses a Hayescompatible modem to call a number from the current profile screen. Like most such organiser programs — with the exception of Sidekick Plus — this is a simple autodialler rather than a full electronic mail facility.

ACT will make a record of the call history – including unsuccessful and successful calls – and you can tell it when there have been incoming ones. If you lack a modem – but not dedication or fussiness – a phone call history can be built up manually.

The Schedule menu is like a diary. You can enter an appointment, a date or time for calling someone back, or a To do task for the current profile. If the task is rated as critical, as long as it is running ACT will sound an alarm in advance.

Different warning times can be set for

meetings and calls, of course. Non-specific reminders – not associated with any one profile – can also be scheduled.

You are automatically warned if anything is being scheduled to fall on a weekend. A *Week at a glance* option is available anywhere within ACT and gives a table of your diary activities.

ACT's Write function is for the production of letters or memos. In letters the date, address of the current profile and the appropriate salutation — such as Dear John, which is another piece of information held in the profile — is automatically entered. So, in a memo just the date and "to" and "from" are entered.

From then on you fill in the details with a simple word processor which provides block copy or delete, find or replace options and margins and tab control. If you save your work the contents of the letter or memo are preserved, but not the automatically generated header.

An identical message to another person can then easily be created by selecting another profile and reloading the file. ACT will also automatically print an envelope or label for the letter just written.

If Lookup is used to select several profiles, the letter writer can be used for primitive mail merging and associated label production. These form letters are, of course, not as sophisticated as is possible with many databases or word processors.

The final part of the program is Reports, which includes some nice touches like a directory of all contacts — in the selected profiles — or a list of all the *To dos*, meetings and calls scheduled for certain days. It is also possible to create user-defined layouts or printouts from the component fields in a manner similar to creating a form letter or report on WordStar. Indeed, an external word processor needs to be used to produce the basic report text. In this will be special keywords or field numbers to represent the different profile fields.

ACT allows some control over the format of the data which is inserted into the report – there can be different levels of numeric precision, justification, leading characters and so on. Unfortunately the

system is user-hostile and you can soon end up typing lines like:

#82:R12,2 #1023:?R15 ": " #23

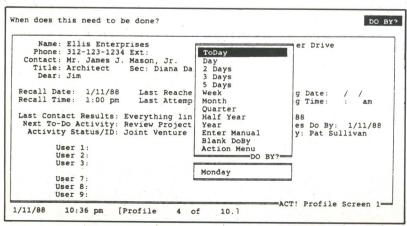
It hardly needs saying that a program of this complexity requires a hard disc or dual 720k 3.5in drives. It does seem strange though, that if ACT is intended for executives there is no mention of the options for networking. Perhaps the reason is that ACT is surprisingly memory hungry. On a 640k PC it begrudged one memory-resident program and refused to generate reports, so on a 512k machine it could be tricky to use.

#### Summary

ACT is a computerised curate's egg – good in parts. It is very slick and some features like the pop-up menus and the calendar work excellently. Conversely the structure of the program and the way it uses function keys is disorientating at first, and the report generator is quite unpleasant.

Despite not being a marketing man, I liked ACT and would have considered buying it if it hadn't dominated the whole computer. To use it to the full it must be loaded almost all the time, and there is precious little room in memory for anything else.

Ignore the claims of breathtaking uniqueness since it looks broadly like a dozen memory-resident programs, from Sidekick Plus down, with the most outstanding difference that ACT is not memory resident. Having said that, the program breaks new ground in several areas and has many features that make microchip bureaucracy a more efficient proposition. Here I would cite the expense account, the ability to link several contacts with one address and the phone call history as good examples which should earn ACT a niche in an overcrowded market.



Many aspects of ACT are menu-driven

# CHECKLIST

- Product: ACT (Activity Control Technology)
- Price: £454.25
- Supplier: Gericmar/Conductor Software, Bridge House, 18 Queen Victoria Street, London EC4 4DP
- Tel: 01-878 9130
  - FOR: Many new ideas and original touches that make it both easy to use and potentially extremely useful.
- AGAINST: Appears cumbersome when compared with competitors such as Sidekick Plus. It is aimed at yuppies who have nothing better to do with a micro than organise their desktop.

# ASSTEC BONANZA!! PER DISK\*





Same Day Despatch—First Class Post!

#### WORD PROCESSING

Childrens Wordprocessor-menu driven, large on-screen fonts, includes sample stories.

City Desk—good print enhancement including graphics and text.

Document Previewer—display up to 8-pages

including graphics and text.

Document Previewer—display up to 8 pages on screen, includes W-Ed wordprocessor & LW letter writer.

Fastype—typing tutor with good graphics, but on-line help bug.

Fontastic—fancy fonts with font designer.

Galaxy—new version (2.41) of this fast, Wordstar (prof) clone has pull-down menus, can draw boxes/IBM graphics, and now has spelling checker, mouse support and more

spelling checker, mouse support and more flexible printing. LQ (V2)—memory resident print enhancement, works alongside your word-processor. Mindreader—guesses your next word, suitable for scenistist, doctors etc.

New York Word (2 disks)—powerful features include tables, macros, indexing, split-screen

PC. Outline-memory resident thoughts organiser, up to 9 outlines on-screen with re-sizable windows.

PC Type+/PC Label (3 disks)—this

version has 100,000 word spell-check and integrates with PC Calc & PC File.

PC Style—analyse your writing, word

frequency etc.

PC Write 2.4—can display mathematical foreign characters, split-screen editing, uses ASCII files (max 64K).

TechPrint—similar to WSMX80 but aimed

at technical document production.

Sail—text editor with ability to view multiple

Spell Check—for use on ASCII files (eg PC Write), also includes EZ file and EZ graph.

Screenwriter—a text formatter for

playwrights. Wordplan—can read 1-2-3 files directly (and automatically updates when values change), does calculations, has pull-down menus

wsmx80—fancy print effects using Word-star (prof) and your epson printer.

#### DATABASE MANAGEMENT

Card Index—simple filing system, can print

Catalist (2 disks)—powerful mailing list manager (over 32,000 names and addresses per list), duplication detection, post code formatting for over 100 countries, merge/split, output on labels up to 8 wide, Rolodex cards

(hard disk req).

Dbase III Screen Code Generator—plus

DBase III +? (2 disks)—well, not quite, but Wampum reads Dbase files, does reports, supports networking and more (requires hard disk).

DREAM (3 disks)—Data Retrieval, Entry and Management system, ideal for setting up your own applications.

FreeFile—well written good documentation.

File Express (2 disks)-popular, fully

featured system.

HyperShell—multi-file Hypertext reference HyperShell—multi-file Hypertext retreence system, help system and menuing system, has intelligent text file viewer, directory browser/file manager, and applications user interface prototyping with pop-up menus etc. Listmate—menu driven label production. Mail Monster—compiled DBase III mailing

list organiser.

Namepal—another popular mailing list controller.

controller.

PC File+ (3 disks)—probably the most powerful, easy to use database manager available, at any price!

VCR—keep a track of your video cassettes and print labels etc.

#### SPREAD SHEETS

As Easy As—amazing Lotus 123 compatible spreadsheet, reads 123 files, macros etc.
Goal Seeker—for use with spreadsheet. Lotus 123 Worksheets & Macros—includes cash flow, line-of-credit tracker, ratio analyser, stats calculator, growth capacity calc, queue analysis, new venture budget, owner generals.

quote generator. Lotus 123 Worksheets (3 disks)—includes financial analysis, import utils, linear stats, biorythms, travel business expenses, flowchart symbols, stock portfolio analysis, rental property analysis.

PC Calc + (3 disks)—son of PC Calc, new features, more powerful, still integrates with PC File + & PC Type +, extensive manual.

Oubecale-many advanced features, plus convert rows to columns, columns to pages, line charts, macros, context-

Side Writer—print out ASCII files on their side, ideal for wide spreadsheets.

Symphony Worksheets & Macros (3 disks)—includes name and address notebook, appointment calendar, graphic macros with rig functions, two-column WP, chequebook, labels, resistance & tolerance or resistors. Turbo Calc—includes a pop-up note-pad like Sidekick, with good editing facilities.

#### GAMES/TRIVIA

Adventure Solutions—hints and tips for popular adventures including Hitch Hikers Children L. Children

popular adventures including Fitch Filters Guide and Infocom. Arcade Games (3 disks)—includes Bugs!, Jumpjoe, Datnoids, Nuclear Attack Simula-tion, 3-Demon, Kong, Bricks, Pyramid, Pitfall PC-Golf

nuda Triangle—sailing quest (EGA

Games-includes Bridge, Othello,

Roulette.
Castle—popular adventure.
Cave Quest—fantasy role-playing game.
Hack—adventure, DND style.
Jacaranda Jim—adventurous exploits in

outerspace. Games 14—Bandit, Mazes, Slot Machine etc. Games 15-Star Wars, Sea Wolf, Frogger

16-Soviets, Bricks FLIGHTMARE.

Games 17—Pac Man, Poker, Castle,

Invaders etc.

Games 18—Breakout, Bugs!, Lander etc.

Games 18—Breakout, Bugst, Lander etc. Get Lucky!—adult games. Mahjong—like oriental rummy with PUNGS, KONGS & CHOWS! Monopoly/Tune Trivia—US version of famous board game, Tune Trivia like 'Name

Origami-paper folding (needs Basic PC Chess—play the computer or a friend,

save load etc.

Pinball Rally—three versions of popular

game.
Sleuth—murder adventure.
Spacewar—shoot 'em up with good graphics.
Trivia (3 disks)—The Trivia Machine has everal categories and levels.

Several categories and levels.

Trivial Towers (2 disks)—more trivia.

Willy the Worm—ladders, rolling barrels etc.

Zork Utilities—help for popular adventure.

#### BUSINESS/VERTICAL

Forms Creation—design, save forms, save forms with data, printout. EZ Forms Exec. Front Office—multi purpose business management (3 disks).

Estate Agents System—storage and retrieval of information about properties, pending and closed sales, plus agents' details and helpful

Estibid (5 disks)—contractors estimating/

costing analysis includes sub-contractors, materials, transport costs etc.

Land Surveyors Tools—Surveysoft calculations include traverse, field traverse, inverse & radial inverse.

ightyear—business efficiency evaluation. Make My Day — Time Management system, Appointment Calendar, Job Scheduler, Time Log and Expense Account

PC Tickle-Personal Schedule Organiser keeps track of important appointments/

Project Management-uses critical path nalysis and can handle up to 1,000 tasks. Stock Market Analyser—tools to gather, enter, chart & plot stocks and securities price fluctuations.

Stock Portfolio Management—Portworth provides portfolio cost valuation, current valuation and bar/line graphs of valuation

change.

Stock Processing (Inventory)—includes levels, listing, ordering, editing, cash register module.

#### ACCOUNTS/FINANCE

Accounts Plus (3 disks)-includes full nominal ledger and product file linked to invoice production (Freeway UK).

Billing/Invoicing System (2 disks)—itemised invoices/bills with balance forward, finance charges, subtotals, balance due, also reports

Budget Tracking (2 disks)—Departmental Encumberance Accounting, up to 12,000 onthly transactions

Cashbook (2 disks)—5 bank accounts, 5 cash accounts payments/receipts posting, 100 nominal accts/VAT codes, VAT summaries

Cash Trac—update of Personal Finance Manager, with checking accouns/print cheque, credit cards, pop-up calculator.

Corporate Financial Analyst (2 disks) pany accounts analysis and planning. needs no modelling or spreadsheet experience, (Computer Financial Models UK).

Payroll (3 disks)—latest legislation, (Freeway UK).

Simplified Bookkeeping—expenses, income, bank account, payroll, accts receivable and

Time & Money—home or small business, ac counts and financial planning.

#### GRAPHICS

Altamira-design posters, cards, logos,

Dancad (2 disks)—from simple letterheads to complex 3D cog-wheels with animation & rotation, new version (2D-UK) has support for post-script laser printers (hard disk req). DROEGE (2 disks)—Printed Circuit Board

Express Graph—3D bar charts, pie charts line graphs etc. from entered or imported

Finger Paint-paint program with Mac-like Gem Drawings/Paintings-extensive

Image 3Dage 3D—wire frame modelling with view, om etc (CGA, EGA or VGA).

PC Graph—charts/graphs from PC File data PC Kep Draw (4 disks)—latest version of popular CAD package now includes library disk, tutorial, and manual disks with superb demo and utility to convert graphics to IMG format for DTP.

PC Picture Graphics-produce, file & display your creations.

Slide Presentation—use camera to take snapshots of screen, then display as at a slide-show, ideal for training, demonstrations etc. The Draftsman (2 disks)—data graphs, slide shows from 123/Symphony/Visicalc.

#### LANGUAGES/PROGRAMMING

A86/D86-probably the best 8086 ssembler/disassembler around.

asic Aids (4 disks)—G.W. basic.

-Window/C-Window—windowing utils for

Basic & C.
C Tutorial—for beginners to advanced.
C Spot Run—C programmers utilities.
Lisp—Xlisp programming language.
Logo—Jem version of turtle-based graphics
leaguest programs and the control of the language, popular with children.

Modula 2 Compiler (2 disks)—flexible but

very powerful.

Modula 2 Tutorial (2 disks)—companion to

Feaster

modula 2 Tutorial (2 disks)—companion to the above.

MVP Forth (2 disks)—full implementation.

P.Basic—GW Basic compatible interpreter for Amstrads etc.

Pascal—three compilers on one disk, Tiny, Facillis & Visible.

Prolog—ADA implementation of 5th generation A1 language.

Quickbasic—tools and utils.

SNOBOL 4—fantastic system designed to minimize programming time and effort without losing power and flexibility, produces .EXE files.

SDA (2 disks)—design screens for data input (Basic).

Rasic).
Turbo C Tutor (2 disks).
Turbo Pascal Tutor (2 disks).
Turbo Pascal Library (12 disks).
routines,
programs, utils, statistics, sprites, animation.

#### EDUCATIONAL/STATISTICS

Play n' learn (ages 2-4)—for the very young, alphabet recognition, computer reaction etc. incl. Amanda's Letter Lotto.

Amy's First Primer (ages 4-8)—new (compiled) version, is a collection of fun games for young children that help them with skills like counting, letter recognition, simple problem solving, pattern recognition and keyboard

Childrens Games (ages 4-8)—hangman, alphabet, animals etc

Epistat—25 statistical calculations including Bayes theorum, Chi-square, Fisher's exact, Mantel-Haenszael, McNemar, Poisson,

Flash Cards (4 disks)—7,500 word vocabulary builder and spelling teacher.

French Tutor-1,648 French/English word combinations, 3,200 verb conjugations and 196 French/English phrase combinations.

Funnels & Buckets-simple arithmetic tuition made into an arcade type game GCSE Physics/Computer Science (2

German Tutor—1,600 German/English word combinations, 3,875 verb conjugations and 160 German/English phrase combinations.

IO Builder-intelligence testing.

Italian Tutor—816 Italian/English word combinations, 1500 verb conjugations and 114 Italian/English phrase combinations.

Maths/Statistics—26 maths routines including prime factors, vector analysis, linear interpolation, gaussian quadrature etc., plus 18 stats calculations including Mann-Whitney, Chi-square, students, T-test, multiple linear regression etc.

PC Prompt-pop-up help with DOS

Phrase Craze-phrase guessing with up to five players.

Spanish Tutor—1,550 Spanish/English word combinations, 3,596 verb conjugations and 150 Spanish/English phrase combinations.

Tutor—introductions to computers, binary numbers and the CPU, input/output devices, Disk Operating System, subdirectory structures, batch files etc.

Whiz Quiz-arithmetic/elementary

00

#### UTILITIES

Ample Notice—appointments calendar, pop-up alarm clock, sideways addressing util for envelopes (can use data directly from the

screen . **Bakers Dozen**— includes mini spreadsheet.
pop-up calendar, diskutil for altering specific vtes, erase complete directories et

bytes, erase complete directories etc.

Deskteam—pop-op organiser includes notepad, alarm clock, calculator, DOS access.

DOSamatic—load and run several programs

DOSamatic—load and run several programs at once, switching instantly between them and DOS services.

Homebase (3 disks.—pop-up calculator, notepad, notebase with autodial for telconversations), background communications, cut and paste etc. (hard disk req.).

Master Key—disk utils like Nortons including file recovery, unerase etc.

PC Shell—unix-like command shell.

Power Menu—hard disk menuing system with side-kick like interface and DOS

with side-kick like interface and 1975 utilities, including re-name, copy etc.

Ram Test—chip diagnostics.

SimCGA—colour graphics simulator for Hercules cards, runs most CGA software.

Still River Shell—another alternative to GEM, this shell protects you from the command-line operation of DOS.

White / disks.—multi-user operating system

Vmix (2 disks)—multi-user operating system along the lines of unix, adjusts itself to 8088 or 80286.

#### SPECIAL INTEREST

Astrology/Horoscopes-birth signs, zodiacs

etc.
ESIE—configurable expert system including example which works out childs illness from

questions and answers.

Extra Sensory Perception—includes tests for determining clairvoyance powers and more. Genealogy—Family Ties traces and plots stral roots

Musical Jukebox-many tunes selectable

from menu.

Micro Gourmet (2 disks,—recipes galore/requires DBase/Wampum).

New Testament (2 disks)—includes Wordworker for tracing phrases, words and their

frequency/position etc.
Old Testament (6 disks)—originally on 12 disks this complete text is archived to save

space.

Pianoman—play, enter and save tunes, also construct stand alone tunes.

PC Musician—enter, save, printout your

own masterpieces.
The Confidant—encodes and decodes sensitive data, menu driven

Boyan D3 (2 disks)—interrupt driven comms 300-9.600 baud, including file transfer 300-9,600 baud, including the transfer. Fido—very popular bulletin board system with E-mail facilities and network capabilities, several in use throughout UK Europe USA. Kermit, 2,6isks—file transfer between man-frames PC's, many\_non-IBM machines

catered for.

One to One - 'talk' directly to other users, upload files while 'chatting' in another

window, superbly written.
PC VT DEC VT 102 100 52 terminal emulation with file transfer.
Procomm V2.42 (2 disks powerful but

flexibile, many file transfer protocols.

Procom UK
Recom resident communications, will
continue to upload-download in the
background while von work on another task.
Telix many features including chat mode.
Wildcat 2 disks - new bulletin board system
which is easy to set up but very impressive.

#### MISCELLANEOUS

Disk Copy Service—we can transfer data between over 300 formats of floppy disk including 55.4" Actorit double density. Amstrad PC's. BBC. ADFS, CP/M, CP M-86, DEC, BBM PC's, NEC, TRS-30 et and 33." Master, PIC, Apricot, Atara, Data General, RM Nimbusete, Prices are £10 per disk, fully inclusive of media/p8/petc. Library Additions—if you have written a shareware program and would like us to distribute it, please forward—a copy with description for consideration. Support—we will be pleased to help you to load and run all the programs we distribute. Disk Copy Service we can transfer data be

but we cannot give support, or written iocumentation/manuals etc for un-registered shareware, as this would be a breach of the



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Because the Aries 8MHz PC-88 system starts at just £489\* . . . and a 40MByte system with EGA monitor

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#### Specification:

- 16 Bit Intel 8088-2 or NEC V20 78108 microprocessor, running at 8MHz or 4.77MHz. (3 times faster than IBM PC/XT).
- 8087-2 maths co-processor, optional.
- 640K minimum expandable to 1024K on system board, extra 384K RAMDISK available.
- 360K Single Floppy (optional 2nd Floppy/3.5"/20MB Winny/T. Streamer).
- CLOCK on System board, gives non stop DATE & TIME.
- 8 expansion slots.
- Microsoft MS DOS 3.30.
- 102 keys keyboard.150W power supply.GW-BASIC 3.21.
- Mono graphics/parallel card.
- Legal BIOS and built in games port and clock.
- High resolution (1000 x 350 lines) State of the art, 14 inch Flat

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\* Full specs and pricing are described below.

All registered trademarks are acknowledged, and all information is believed to be correct at the time of going to press.

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#### Specification:

- 80286 microprocessor.
- Optional 80287 Maths co-processor
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- 1.2M Single Floppy (optional 2nd Floppy/3.5"/Winny/T. Streamer)

200W power supply.GW-BASIC 3.21.

- CLOCK on System board, gives non stop DATE & TIME. 102 key keyboard.HDD/FDD Card.
- 8 expansion slots.
- Serial/Parallel Card.
- Switchable Speed 8/12M
- Landmark test at 16MHz.
- Microsoft MS DOS 3.30.
- Mono graphics/parallel card (Herc. Compt.)
- Slide in metal case with function display
- Legal BIOS and built in games port and clock.
- High resolution (1000 x 350 lines) State of the art, 14 inch Flat Screen Monitor.

## FREE 12 month On-site Maintenance warranty (UK mainland) included in the price

Available in the following configurations:

- System 1 Aries PC-XT 88 including 14" hi-res monochrome Flat Screen monitor
- £489 System 2 - Aries PC-XT 88 System 1 as above plus a 720K 3.5" Disc Drive fitted
- System 3 Aries PC-XT 88 System 1 plus a 20MB Hard Disk fitted £799
- System 4 Aries PC-XT 88 System 1 plus a 40MB Hard Disk fitted F849
- System 5 Aries PC-XT 88/EGA hi-res Colour System, specifications as in 4, including Aries EGA Monitor/EGA Card and 40MB Hard Drive fitted.

At a breakthrough price:

£999

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- System 3 Aries PC-AT 286 System 1 plus a 20MB Hard Disk fitted £1099
- System 4 Aries PC-AT 286 System 1 plus a 40MB Hard Disk fitted £1199
- System 5 Aries PC-AT 288 / EGA hi-res Colour System, Specification as in 4 including, Aries EGA Monitor/EGA Card & 40MB Hard Drive fitted.

At a breakthrough price:

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£799

£889

To start you up we include FREE £60 worth of PC Organiser software, consisting of: Wordprocessor, Database, Auto-Dialler, Desk Diary, etc.

#### **MONITORS**



WE stock a range of Monochrome and Colour monitors, to suit all needs.

#### **ARIES MONITORS** 14" Monochrome

These State of the Art monitors have been engineered for dual-frequency output on a chemically etched, Non-glare, Flat screen. IBM compatible, high resolution (1000 x 350 lines), band width: >20MHz. Other viewer-friendly features include front-mounted controls and swivel base to adjust viewing angle. Available in Green, Amber or Paper White.

Туре	Description	Price
ArM1000G	- High Resolution Green	£93
ArM1000A	- High Resolution Amber	£95
	- High Resolution Paper White	£97

#### **Aries 14" EGA Monitor**

Stylishly designed, high contrast non-glare screen, 16-64 colours, switchable to green or amber screen for wordprocessing. EGA compatible. Resolution (720 dots H. x 350 lines V.) Built-in Tilt & Swivel base.

Aries EGA Monitor	£299
EGA Card	£119
EGA Monitor plus Card	£379

#### Multisync Monitors 14"

- TAXAN 770 Plus An autoscanning Ultra high res 14" Colour Monitor.
- EIZO Flexscan 80605 14" colour. Has a staggering 0.28mm dot pitch
- NEC JC/1401 P3EE Intelligent Ultra high res 14" Autoscan freq. between 15 to 35KHz. Text switch provides 7 colours

#### Aries 1458 Multisync **VGA MONITOR**

Like the Aries monochrome monitors, Aries 1458 is a state of the art, stylishly finished, flat screen, Enhanced Multisync Colour Monitor. It also works with a monochrome card. An autoswitching device changes modes without having to adjust the monitor. Its wide frequency range (15-45KHz) and multi-colour display allows increased options and flexibility. 0.31 mm dot pitch. Input Signal: TTL/Analogue, H-Sync 15-45KHz; V-Sync 47-100Hz; Bandwidth 35MHz; Resolution 800 x 600 Hiresolution Multi colour Display; Compatible with MGA, CGA, EGA & VGA – Analogue; – limited only by the video display adaptor; works with a monochrome card. Built-in tilt & swivel base.

Launch Offer - £349

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CREDIT TERMS now available. Please telephone or write in for further information.

#### **Hard Disc Cards**

3.5" Hard Disc on a controller card. "Simply Plug and Play". For Amstrad 1512/1640 & XT compatibles.

● WD-XT 20 ME			£195
			£239
<ul> <li>WD-XT 30 MI</li> </ul>			LZJJ

For PC AT & AT Compatibles.

WD-AT 30 MB £345

#### **Hard Disk Drives (Bare Units)**

WEHD20 21MB Hard Disk	£159
WEHD30 30MB RLL Hard Disk	£179
WEHD40/40mS 42MB HD including	
partitioning software	£215
WEHD40/28mS 42MB HD including	
partitioning software	£299
WEHD65 65MB HD RLL	£395

#### **Controller Cards**

WEXT100C XT Controller and Cables     WEXT200C (RLL XT Controller and Cables)	£49
WEXT200C/RLL XT Controller and Cables	£79

#### **Hard Disc Kits**

- WEHD20(KIT) 21MB HD with XT-Amstrad Controller + Cables WEHD30(KIT) 32MB HD with XT/Amstrad
- Controller & Cables £22
  WEHD40 (Kit) 42MegB HD with XT/Amstrad
- Controller & Cable

#### Floppy Disc Drives

• UC200 5.25" 360K 48tpi Double Sided	
Disc Drive	£85
• UC600 5.25" 1.2M 96tpi Double Sided	
High Density, Disc Drive	£99
• UC35/4 3.5" 720K Drive with 5.25" kit	£89
<ul> <li>UC35/6 3.5" 1.44M Drive with 5.25" kit</li> </ul>	£99

#### **Tape Streamers**

For XT & AT. 60MB External kit with software, short controller, cable and documentation. Backs up 60MB in less than 12 minutes.

£475 Type: WE5000/Tape

#### **ADD-ON CARDS**

480 Auto Switch EGA Card, 256K RAM,

compatible with CGA, MGA & EGA.	£119
FLOPPY/HARD DISK Controller for AT	£129
HARD DISK Controller for XT	£79
MONOCROME GRAPHICS CARD (incl.	
Parallel printer port)	£34
COLOUR GRAPHICS CARD - RGB Colo	ur
and Composite Video (includes parallel	
port)	£36
RS232 CARD with 2 ports	£25
MULTI I/O Card includes: Real Time Cl	ock/
Calendar, Serial/Parallel/Games	£43
SERIAL/PARALLEL CARD (2 serial port	, 1
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The Dr. Halo III software supplied with the mouse is a professional art package. The features are:

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Colour mixing facility

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#### Accessories

• FY000/4000 0 1 0 1	
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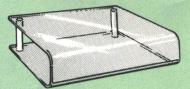
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(Or	continuous fanfold backing sh	reet)
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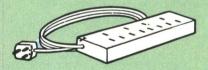
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 Improves efficiency by making more efficient use of computer and printer.
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Modems.

Ideal for those doing large graphics screen

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 Data Dump facility is included.
 Built in test unit for both the buffer & your printer.

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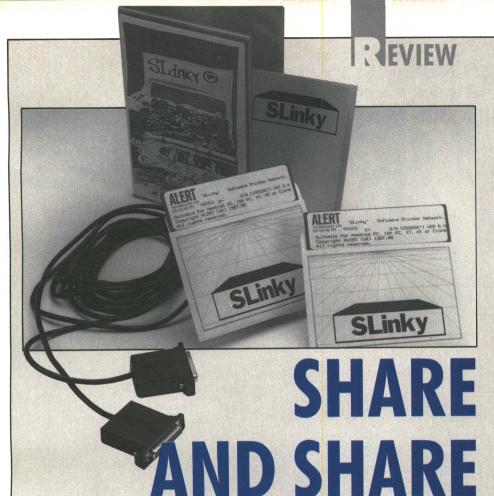
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THERE must be many offices and small businesses which need to share facilities but don't want — or can't afford — to spend large amounts on a full-blown network. Whether you need to share a hard disc, a printer or both, there hasn't really been a cost-effective alternative to a network.

However, all that has now changed with the two low-cost products reviewed here. They will open up the concept of shared resources to people who couldn't previously justify the expense.

#### **\$25 Network**

This originated in the USA where it, naturally, costs \$25, and is distributed in this country by EQ Consultants of Fife. The extraordinarily low US price loses something in the translation – here it's £25 plus Vat – but still peanuts in relation to the program's usefulness. The £20.75 Network somehow doesn't have the same ring.

Being entirely software based, it operates through the serial ports, and installation requires you firstly to provide standard null-modem cables. You can do as I did and make these yourself, using the diagram provided, or you can buy them ready made from a dealer or by mail order. If you want to link three machines, the middle one must have two serial ports.

All that remains is to copy the \$25 Network software on to your boot disc and alter the CONFIG.SYS and AUTOEXEC.BAT files to suit.

Let's suppose you have a setup with two linked PCs. They have a floppy, a hard lan Sharpe looks at two low-cost products which could mean networking for all

ALIKE

disc and a printer. With the network installed, the floppy on the second machine is drive E and the hard disc is drive D. If either user sets up a ram disc, it is accessible over the network too.

Either of the printers is available by directing output to LPT2, and from the remote end, the local equipment is accessed in the same way.

You can type a file to the remote screen and vice versa. If you wanted to keep a drive or printer to yourself, you wouldn't have told the \$25 Network about it during installation.

While this system is so simple that it requires almost no learning, it has potential drawbacks. Using someone else's drive over the network is slower than using one of your own because the serial port is running at 115k baud, which is slower than the PC's internal data transfer rate. This is a feature of any software-based network, so it shouldn't count against this product in particular.

The main drawback is that although you can exclude other people from your printer

or an entire drive, you can't lock subdirectories or files. If you're working on a file and someone else nips in and alters it before you save your work, their alterations will be overwritten. Therefore you need to agree with everybody on the network not to use a particular file until you've finished with it. This shouldn't be inconvenient, though whether it is for you will depend on your circumstances.

Another use for the network is transferring files between a laptop and a desk-bound PC. With COPY and XCOPY you can duplicate the functions of a specialised file transfer utility.

For those whose networking needs are simple, and bearing in mind the limitations — particularly having your serial ports tied up and the inability to lock files — I can recommend this system as both cheap and easy to use. Before spending any money I suggest you price up the cables, because if you want to link more than two machines they could work out more expensive than the software.

## CHECKLIST

- Product: \$25 Network
- Price: £28.75
- Supplier: EO Consultants, New Gilston, Leven, Fife KY8 5TF, Scotland.
- Tel: 0334 84248
  - FOR: Cheap, simple to operate.
- AGAINST: Can occupy up to two serial ports. Can't lock sub-directories.

#### SLinky

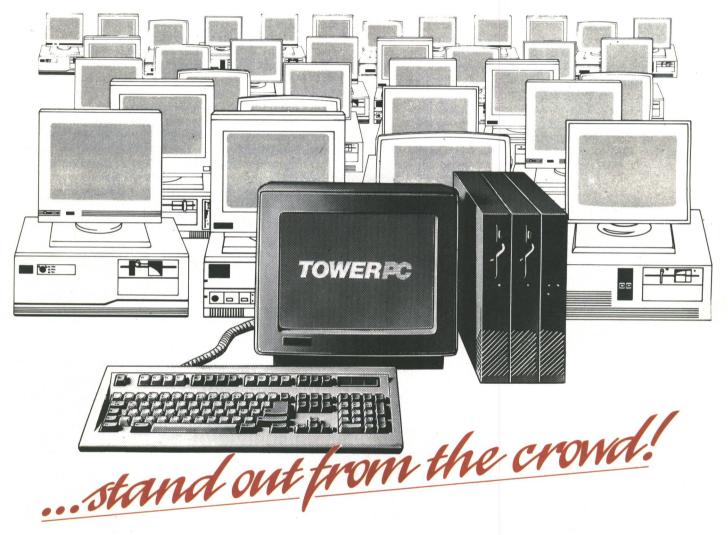
This British product uses the serial port as a means of sharing the resources of up to 26 computers. Apart from the increased limit on the number of PCs you can link, SLinky differs from \$25 Network in two ways – it is purely for sharing printers – you can't access data – and if you want to connect more than two computers you need one or more inter-connection boxes.

A box has four outlets into which you can plug up to four PCs. If you want a fifth PC, two units daisychain together, leaving capacity for three computers on each box. Three boxes can handle eight micros, and so on. The distance between micros can be up to 40 metres.

Installation couldn't be easier because there's a setup program where you fill in details such as your name on the network, the name of your printer, and the baud rate of the serial printer if fitted to a second serial port. The software is intelligent enough to recognise what you have fitted in the way of parallel and serial ports, and whether there is a conflict with interrupts

Turn to Page 87 ▶

# Computers Computers



You can be forgiven for thinking that all desktop microcomputers look the same, because, until now, they have. However, the arrival of the new range of micro's from Schneider sets new standards in design, performance and value for money. After all as a leading West German consumer electronics manufacturer we have a reputation to protect.

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For those requiring powerful computing performance in an attractive and conveniently transportable package the Portable AT is the obvious choice.

Ask your Computer Dealer for details of the trend setting Schneider range and don't forget that each model comes complete with Microsoft Works, the leading integrated software package (worth over £140) comprising word processing, spreadsheet, database, graphics and communications.



#### ◆ From Page 85

set up by other software.

From then on operation is straightforward and fuss free. SLinky can be called up at any stage by means of a hot-key combination which is definable during installation. A small window appears on the screen and you can scroll through the names of the other computers on the system. Pressing Return selects the currently displayed name as the target for printer output.

I connected three micros and printers together, and all worked well. SLinky incorporates a printer buffer enabling data on each machine to queue up for the printer while you get on with other things

This is doubly useful when you consider that there will probably be fewer printers than users on the system, so SLinky might have to wait for the chosen printer to become free. Incidentally the buffer is also available as a separate program.

Other facilities available in SLinky's command window include a report on the printer's status, the ability to send form and line feeds, clear the printer buffer, do a repeat run on what's in the buffer and send a short message to another person

on the network. I found only one problem with the program. The Protext word processor can use its own keyboard driver which speeds up cursor movement.

Unfortunately it also wipes out Slinky's interception of the normal keyboard vector which enables it to be called up by a hot-key combination. The cure is to tell Protext not to use its own driver, or to install SLinky after Protext has loaded.

Presently SLinky only uses the parallel or second serial port, so it won't use those postscript laser printers which work via a video-adapter type card. However, Alert Technology says that an upgrade is in the pipeline which, with postscript printers weighing in at several thousands of pounds, should be very worthwhile indeed.

At first sight SLinky appears to do less than the \$25 Network at a higher price, but this is not true. As a printer controller SLinky is more powerful, and the buffering and the ability to link more than three micros gives it much more scope for expansion.

If your motive for getting into networking is the sharing of printers, SLinky makes a viable alternative to conventional methods.

#### Sample SLinky prices

Users	Price	
2	£114.43	
3	£189.00	
4	£240.35	
5	£314.53	
10	£618.13	
26	£1,625.53	

Prices include inter-connection boxes where necessary and one cable. Further five metre cables are £15.53 each. Software printer buffer available at £40.25.

## CHECKLIST

- Product: SLinky
- Price: See panel
  - Supplier: Alert Technology, Alert House, Station Road, Calveley, Cheshire CW6 9JL
  - Tel: 0829 261196
  - FOR: Easy to install and use.
  - AGAINST: Ties up a serial port. Cabling for large networks adds considerably to the expense if you don't make it yourself.

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TO ORDER, PLEASE USE THE FORM ON PAGE 125

PEOPLE are starting to find that they want to include images in their documents. And there are those who have discovered the joys of computer drawing and painting programs who want to work on an existing image.

You can always trace out the image using a digitising tablet. But an easier and more flexible method is to use a video digitiser. Then you can take a live or recorded video image, turn it into binary, manipulate it with an art package and either print it out or read it into your document. That way you can have everything from a promotional video still, through a mugshot to a painting or drawing.

Naturally you can't just plug a video camera or recorder – VCR – into your PC, life is never that simple. Luckily, there are plenty of packages around which provide you with the neces-

sary interface.

We looked at two — Video Digitiser by The Electric Studio, and Vidi-PC by Rombo Productions. Both are relatively inexpensive packages which include digitising hardware on a board and software to run it.

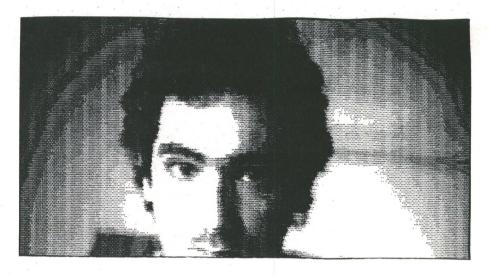
The hardware for both systems comes in the form of standard PC expansion cards. Connecting them to a video source is very easy. Each card has a standard phono socket, so the lead you're likely to need is a phono to BNC type. The appropriate video out signal from VCRs usually comes via a BNC socket as does that on mono cameras.

I started by hooking up to my domestic video recorder. This gives you the option of using the incoming TV signal or an existing tape recording — although please note the panel concerning copyright.

It seemed as if I was all set for hours of fun, but it turned out to be a little more difficult than that. Because the TV image is constantly changing, it's difficult to judge precisely the effects of changing resolutions and exposures in the digitiser software

What I needed was some kind of static image. Pressing the Pause button on the VCR simply wasn't good enough as the signal is then too weak to drive the digitiser board.

The solution was to borrow a video camera. The one I used was a simple black and white model, as the digitisers only work with mono images anyway. Then I needed a subject. Out of interest, and for the sake of simplicity (and not vanity – honest) I turned the camera on myself.



# PUT YOURSELF IN THE PICTURE

With desktop publishing becoming more popular and word processors more sophisticated, ways of getting pictures into your PC are needed.

Steve Mansfield investigates two new systems

#### **Electric Studio**

Electric Studio's product is impressive from the moment you run it. The software starts with a snazzy picture of a Porsche. Hitting Return puts you straight into live digitising, albeit in the lowest resolution, two-colour mode.

Along the top of the screen is a status line, showing the resolution, number of shades, exposure level, zoom ratio and whether the exposure is automatic. Alternating I and \* characters indicate that the system is in the process of digitising, and gives an indication of how fast it is

working. If you freeze the frame, the status line displays the word Stopped.

Other characters on the status line show which interlace lines are being used and whether the image is normal or reversed. Flipping a picture into inverse

video can have some startling effects, especially in colour.

Three levels of screen resolution are available. The lowest, 768 horizontal by 192 vertical, is designed for use with CGA monitors and dot matrix printers. The other two — medium (768 by 384) and high resolution (768 by 576) — are meant for owners of high resolution monitors and laser printers, but even those people without the relevant equipment might enjoy the screen images.

Three monitor modes are also supported – a mono CGA mode giving a resolution of 640 by 200 and two colour EGA modes of 640 by 200 and 640 by 350 pixels. These settings determine what is actually shown on the screen, as opposed to the resolution of the digitised image stored in memory.

The monitor modes are selected with the M, C and E keys, while you select low, medium or high resolution with the shifted F1, F3 and F5 keys. Indeed, the function keys are used extensively in this package. Using F1, F3 and F5 gives one, two and three times zoom respectively.

The shifted F2, F4, F6 and F8 keys select how many shades the image will have -2, 4, 8 or 16. These are shown as colours on a CGA or EGA display, and grey shades on an Amstrad mono monitor. On other mono monitors, the shades are repre-

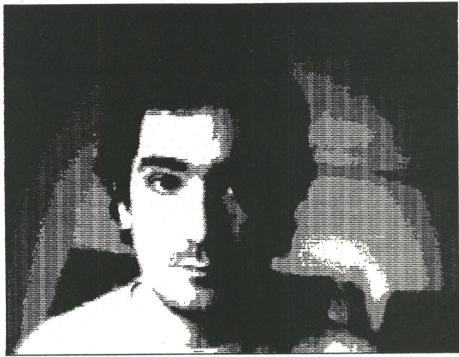
sented by dot patterns. In the case of colour, it's up to you which colour represents which shade, as they are all fairly arbitrary.

If you are having trouble when hooked up to a camera, it may have something to do with the interlace. Normally, each image scan is done in two passes, with the lines of the two images interleaving. Occasionally, the two scans get out of sync particularly when you have a moving subject. The resulting abstraction sometimes looks uncomfortably like Art.

The Electric Studio system allows you to turn off one or the other of the interlace scans, which can result in faster, cleaner images. I found I got the most reliable pictures with the camera using just the even interlace lines.

A 256 shade option is available which allows you to digitise only the odd or even interlace lines. You'll need something like a PostScript laser printer to dump it, as well as a lot of disc space for storage. And it takes an awful long time to digitise. However, the manual claims that extremely smooth tone gradations are possible. Not having the required printer, I never got around to trying it.

The higher the resolution, and the more shades you have, the longer it takes to digitise each picture. This is important if you're trying to grab a still frame. Hitting the space bar freezes the frame which is currently being digitised. But as that can take anything from half a second to 12 secs the effect can be somewhat delayed.



16 shade, high resolution output from the Video Digitiser

An alternative to hitting the space bar is to switch to single shot. In this mode, the program digitises one image and stops, waiting for you to decide what to do next. It's the most useful mode when dealing with a static subject, when you want to see what effect a change in lighting or positioning has on the picture.

The longer digitising times can be difficult if you're trying to frame a picture.

Fortunately, hitting V puts you into a low-res, two colour mode with very fast digitising – giving a real-time moving image. Once you've got the system set up, hitting the space bar returns you to your original settings.

The level at which one shade turns into the next can be set manually or auto-

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Image problems can occur if the interface is wrongly set



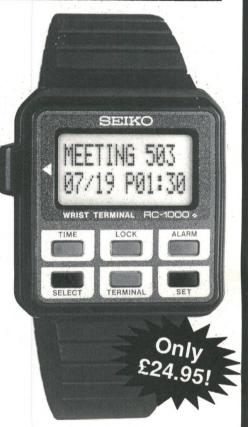
Video Digitiser in two-colour mode

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matically, using the A key to toggle between the two methods. In the twocolour mode, for example, this setting determines whether a particular light intensity is represented as black or white.

In the automatic mode, the program hunts around for the setting which gives an even overall balance between light and dark tones — which is pretty much how a light meter works in a camera. But just as with cameras, this system can be fooled by predominantly light or dark subjects. In the end I found the best method was to start off on automatic, to get a general setting, and switch to manual for fine tuning.

The Electric Studio software supports a wide range of file types. It has its own type which stores all information about the image to disc. It will compress the data if you ask it to, but the file can still be anything up to 220k long.

Both black and white and 16-colour Gem file options are available, which means the pictures can be used by a wide variety of Gem-based desktop publishing, design and paint programs. There's a 16-shade encapsulated PostScript option for laser printer and desktop publishing users, and a PCX option for PC Paint owners. Finally, there's a tag image file (TIF) option, as used by some DTP programs.

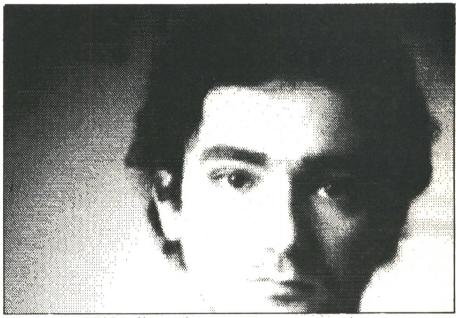
#### Hard on ribbons

The print menu gives you a choice of FX80 and compatible 9-pin dot matrix printers, Hewlett-Packard laser printer at 150 and 300 dots per inch resolutions, Epson LQ-1500 and compatible 24-pin printers and PostScript compatible lasers.

I had an LQ-800 attached at the time. I wasn't expecting too much, years of experience having taught me to be distrustful of printer dumps, especially when printing from colour screen images.

The first image I tried was at low resolution but the full 16 shades. The result was surprisingly good. The grey levels were well represented with different pixel patterns, and gave tree which is the closest you'll get to a continuous tone image with this kind of technology. As with all image dumps, however, it really hammered the ribbon. It wasn't long before the pictures started getting very grey. So if you plan to do a lot of this kind of work, make sure you have plenty of spare ribbons.

I also tried using the Hermes 820 thermal printer in its FX emulation mode. The FX dump rotates the image so that it is printed sideways, giving a much bigger picture than the horizontal LQ dump. However, the lower resolution of the 9-pin



Vidi PC - 16 shade high-res Hermes printer

image is noticeably more ''blocky''. But the thermal technology really came into its own, with extremely dense blacks producing quite a stunning image.

Both FX and LO dumps properly maintained the aspect ratio, so there was no distortion of the image. They also showed the whole picture, the screen image is only around 80 to 90 per cent of the full picture, although you can see the rest of it by panning with the cursor keys. It's also possible to zoom into portions of the image.

Included in the digitiser package was a program called Screen-Master. It comes on three discs, each one coping with a different kind of PC display – CGA, EGA and so

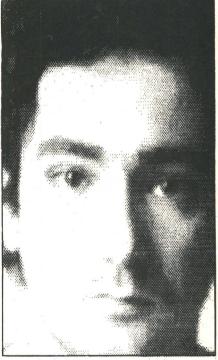
Screen-Master is a simple paint program, which is capable of loading Gem screens produced by the digitiser (or other programs). This means you can create the original image with a camera, or off a video recorder, and then add text and graphics, or manipulate the images with Screen-Master.

Although it's pretty basic, Screen-Master is a handy addition to the package, especially as it's free. But one word of warning — if you haven't got a mouse, forget it. The program uses an arrow cursor with drop-down menus, and keyboard control is so slow as to be unusable.

#### Rombo Vidi-PC

The digitising process is somewhat faster with Vidi-PC than with Electric Studio's system. And this may have something to do with the way the image is treated.

You still get a choice of 2 to 16 shades,



16 shade - high-res Epson LQ800

but Vidi-PC represents them as stipple effects rather than colours on standard PC monitors. The effect can be very confusing by the time you get to 16 shades, but it helps to cut the time taken to produce each frame considerably. On Amstrad machines you get 16 grey shades with mono monitors and 16 colours with colour monitors.

Vidi-PC's status line is along the bottom

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I TOLD you last month how to kill and run away when others come after you with the axe, the rusty longsword or even the mild unassuming rat which hath teeth the like of which I have never seen.

The best way to practice if you are a worthless beginner is by bashing the mobiles like the deer. But sooner or later another player will attack you, and if he is any good he may do rather more than just type K BABY LS and wait to see what happens.

So learn your spells. You cannot use all of these at once but when you have acquired enough points new spells become available. But you must know what some of them are in case big tough bullies like Spitzen use them against you!

Most useful is STEAL which you can use to deprive your opponent of his only weapon.

Then there's STRIP and FUMBLE. The first makes you drop any weapons you are carrying, and the second makes you drop everything. Useful in fights where your opponent has more than one weapon.

When it comes to the best weapons like the rusty longsword or the rat, you can only carry one at a time unless you steal another. So if a player has both, and you make him drop them, he can only pick up one, leaving the other for you.

You need to know how well you are doing in a fight, in order to flee in time. Spitzen's remaining stamina can be revealed with QS SPI, and as you will see your own going down, you can tell who is winning. Spitzen of course, so run away and hide!

To find out what weapons Spitzen has use I SPI. But remember players may be carrying invisibly, so you may have to guess or wait until attacked.

A very nasty spell is CRIPPLE which only lets you move one step at a time by typing HOBBLE. Fighters who use this are the scum of Shades but there is no law against being scum, so be careful.

If you are not much good at fighting your best bet is to QUIT straightaway and log back on to whinge and moan and let everybody know what you think.

Above all, if you want to learn how to fight, do not use your favourite character, create a special one to practise with. Later you can take out your 'main' character reasonably confident of handling the killers.

Next month I will talk about the safe places in Shades like the pub, the church and the bridal suite, and what you can do in them (Oooo-errr.!)

May the goddess be with you!

Whirlwind

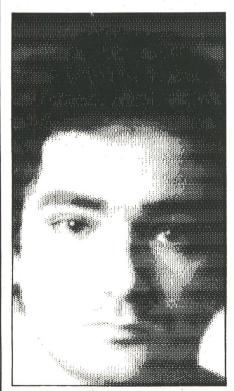
PS Congratulations to Stunner the really gorgeous Witch, the first TG player to reach immortality! Also to Stingray who made it in record time - at the second attempt He He!

And hi to the MicroLink gang - Arfabrain, Skeeve, Zimmerman, Mnementh and Zakym. And a special hello to Dodo from Iceland!

You can enter the land of Shades using your micro, a modem – and a registration to MicroLink. If you are not a member write for details to: MicroLink, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.



Vidi PC 16 shade - low res printing Hermes printer



Med-res 16 shade Hermes printer

#### **◄** From Page 91

of the screen. Left and right cursor keys are used to select the setting you want to change, or to flip into the main menu.

The settings are: Contrast and brightness, single-shot or auto-run, number of shades, and filter on/off control. Turning the filter off allows stipple shading even in the two-shade mode — in other words, it doesn't force the image into pure black and white.

Two other controls are available which affect horizontal and vertical position. Like the Electric Studio system, Vidi-PC doesn't show the whole of the incoming image on the screen. Changing these two settings allows you to select which part of the picture is shown.

Moving to the main menu gives you access to the window, files and print facilities. The area of the screen used for displaying and grabbing video images can be defined using the window option. The window setup – its size and position – can be saved to disc for later use. The files section allows saving and loading of images, either in 16-shade Vidi format or as a Gem image.

Regardless of how many shades are shown on the screen, the program always

prints the full 16. However, you do get a choice of three print resolutions, so you can opt for detail or speed. It's worth bearing in mind, however, that the term speed is relative. It can still take a couple of minutes to print the image, even at low resolution.

I tried both the Epson LQ-800 dot matrix and Hermes 820 thermal printers. The Epson output was good, the Hermes output, with its rich blacks was superb. After printing a few images, however, the one-shot ribbon in the Hermes ran out, thereby neatly illustrating the heavy use all dumps make of the printer.

The Epson image did show a little distortion. However, Vidi-PC's print menu does give a chance to alter the aspect ratio and size of the printed image. This means you can have extremely large images on wide carriage printers.

The digitised image has a resolution of 320 by 200 pixels, which uses all of the system's onboard 32k of ram. Rombo is offering a couple of upgrades to extend this. The first is an extra 32k of memory, allowing image resolutions of up to 640 by 200 pixels. The second option takes the RAM up to 128k, increasing resolution to 640 by 400. It will also allow 256 grey levels, providing a still image source is used — in other words, it takes a while to do it.

However, the existing software isn't capable of handling this at the moment. Rombo says it is working on the 256-scale software. In the meantime, the hardware is ivaliable for those people who want the extra resolution, or who want to have a go at writing the 256-scale software themselves.

The digitiser board has to be returned to Rombo for the upgrades — it's not the sort of thing average users can attempt themselves. Each upgrade costs £33.35, but if you want to go for the 128k version you have to have the first upgrade already installed. Alternatively, you can get both done at the same time for £56.35.

Rombo says it is working on further enhancements, including colour digitising, video output for re-recording of digitised images and support for a wider range of displays. The company hasn't committed itself to dates for any of these, but it does promise that all software upgrades will be free of charge.

#### **Summary**

The Electric Studio package is the more sophisticated of the two, especially in its choice of file types and features such as interlace handling. The software is easier

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# EVIEW

#### **◄ From Page 93**

to use, and you get Screen-Master thrown in. It is also capable of producing colour screen images on non-Amstrad PCs.

Rombo's Vidi-PC is more directly aimed at the Amstrad market, and has the advantage of faster digitising. Used in single-shot mode, it is very easy to grab the frame you want. In both cases, documentation is

CHECKLIST

Product: Video Digitiser

Price: £149.95

minimal, which is all it needs to be. The software is easy to understand, being menu-driven, and the manuals adequately explain the more esoteric features.

My personal preference is for the Electric Studio package. But both products are capable of producing high quality images for use with desktop publishing and design software.

## CHECKLIST

- Product: Vidi-PC
- Price: £113.85
- Supplier: Rombo Productions, 107
  Raeburn Rigg, Livingston, West
  Lothian FH54 8PH
- Tel: 0506 39046
- FOR: Fast digitising at all resolutions.

  Easy to grab single images. Good print options, including sizing and aspect ratio. Resizable window.
- AGAINST: Poor screen display in highres modes with non-Amstrad PCs. Limited file types supported.

#### Copyright

Images taken from the TV, or from prerecorded video tapes, are subject to copyright. The act of recording these pictures as a digitised image on disc is technically an infringement of that copyright.

If the pictures are used purely for your own enjoyment, nobody is likely to get upset. But publishing the pictures — in magazines, newsletters or reports — is pushing your luck. If you do want to use these images for any reason, contact the copyright holder first and ask permission.

At one time it was possible to use images of live TV broadcasts. As the pictures were not from recordings, copyright wasn't assumed to be applicable, although the same didn't apply to action replays, which were recordings. But all this may change, particularly with the new copyright laws coming in — so beware!

Of course, pictures you produce yourself with a video camera are nobody's business but your own. The copyright automatically belongs to you, so you can publish the images with impunity.

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# The macro collection

ONE of the most powerful features of 1-2-3 is its macro facility. Lotus originally touted this as a way of reducing the number of keystrokes necessary to input items of frequently entered data. However, it soon became apparent that many of the functions of a high level programming language had been implemented.

For instance, you can use inputs, loops,

branches – conditional and unconditional – labels and so on. Well designed macros can make any Lotus 1-2-3 worksheet easier to use and much more powerful.

The 1-2-3 Power Pack is a collection of 150 macros. Ten of these are already on the floppy disc which comes with the book and they are supplied in both .WKS and .WK1 formats. The former are for those with release 1A, the latter for everybody else.

The macros range from the very simple, such as macro 83 which asks for a cell address then makes a copy of that cell's contents into the current cell, to the complex. Macro 121 comes into this category and is an in-line printer controller

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running to 61 lines of code.

Although the volume has been very nicely produced, I almost had to demolish its back cover before I could get my hands on the disc — a shame. I really do wonder how many people will want to lay out nearly £40 for this book.

If you are conversant enough with Lotus to want to develop sophisticated macros, you won't have much trouble in doing it on your own. Most occasional users will be put off by the rather terse explanations.

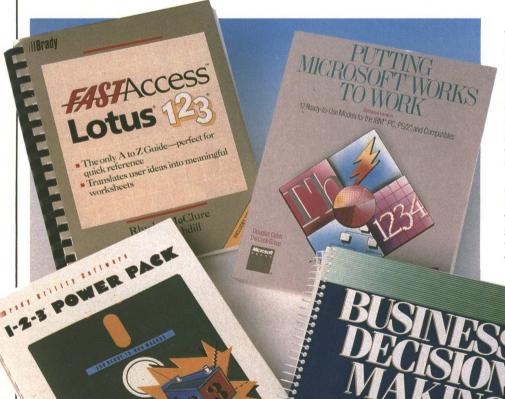
Product: The 1-2-3 Power Pack, by Steven J. Bennet and Peter G. Randall. ISBN 0-13-635400-9. 325 pp with 5.25in disc.

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# Assuming the Lotus position

WHETHER or not you believe that Lotus 1-2-3 is the best spreadsheet-cum-graphics-cum-database program in the world, there's no denying its popularity. Indeed, it has given rise to a whole new service industry, with books, discs, video tapes and quite possibly stained glass windows as well, all available from your friendly local dealer.

Fast Access Lotus 1-2-3 is the most basic of the Lotus books reviewed this month. It's aimed at the occasional user who wants to get the best out of his or her software without having to rummage through the program's own rather verbose manuals.

Remarkably for such a long book, it has

John Hughes looks at a variety of books on Ashton-Tate, Borland and Microsoft products only three chapters. The first is a short general introduction to starting the program, moving around, loading and saving Lotus worksheets and other basic information. Chapter three is little more than a 15-page problem solving appendix.

The real meat is in the enormous second chapter which covers just about every major Lotus command, listed in alphabetical order. Each is briefly explained and this is often followed by a useful tip to keep you out of trouble.

Then there's a worked example which is followed through in some detail. You are told exactly what to type and how Lotus 1-2-3 will respond, from the first key stroke right down to the appearance of the screen when the command is completed.

The book amply succeeds in doing what it sets out to and, moreover, does it at a very reasonable price. This would be a very useful addition to the library of anyone who uses Lotus 1-2-3 on a fairly regular basis.

 ▶ Product: Fast Access Lotus 1-2-3, by Rhyder McClure and Mary Abdill. 296 pp. ISBN 0-13-307521-4.
 ▶ Price: £11.25

Supplier: International Book Distributors Ltd., 66 Wood Lane, Hemel Hempstead, Herts HP2 4RG.
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# Business school with 1-2-3

I AM not sure whether this is really a Lotus 1-2-3 book or a lengthy case study of how an American-style marketing campaign for Suave Shampoo was put together with the help of information analysed using Lotus. The fact that the authors are on the staff of the Harvard Business School suggests the latter interpretation would be the right one.

Computing and management aspects are discussed side by side. For instance, lesson nine shows how to work out a break-even analysis. There are about six pages of computer instructions, explaining how to protect and unprotect cells, which formulae to enter and so on.

With this there are several management discussion questions such as: "When should your analysis include projections of industry growth rates?" These are obviously aimed at tutorial groups in business school. The accompanying discs contain all

# Long winded, but it works

THE next book in this month's Library is first and foremost a collection of spreadsheet templates for use with Microsoft Works. It comes with copies of the templates on two 5.25in discs fastened inside the back cover, though I suspect the decision to bundle them was taken rather late in the day – the text often assumes that you'll be typing everything in.

Although Microsoft Works is an integrated spreadsheet/database/word processing package, author Douglas Cobb concentrates on the spreadsheet side of things. Where this book differs from many others is that it not only provides you with the templates and explains how they work, but also uses them as a teaching tool.

It is assumed that you know nothing about using the program, even loading it. Thus begins a general introduction which explains the appearance of the screen, the use of the function keys, using a mouse, the structure of the dialogue boxes and menus and loading and saving files. A general understanding of MSdos is taken for granted, however.

The 12 templates have been carefully chosen to be both useful and instructive and they include such golden oldies of the spreadsheet world as cashflow tracking, cheque book balancing, break-even analysis, profit and loss calculations and cash flow projections.

None of these ideas is exactly new and exciting, but after all this is essentially a book for beginners. American beginners

apparently like their books to be fat and impressive. Consequently, a great deal of room is taken up with key-by-key accounts of what has to be typed in. Since all the details are on the discs anyway, this thoroughness seems rather pointless — a great deal of the information which you are told to type in has already been entered for you.

In some ways this volume simultaneously displays all that is best and worst about American computer books. On the credit side, it is unerringly accurate, although the inevitable Americanisms are irritating. It is also illustrated with screen dumps and has been very nicely printed and bound.

On the other hand, it is about twice as long as it needs to be and the prose is wordy to the point of dullness. The whole thing has been treated as a production rather than as an honest-to-goodness book. Consequently there are special credits for the designer of the cover, the typography, layout and the principal production artist.

If you want to learn how to use Microsoft Works, this book will certainly tell you, but you may fall asleep while reading it.

Product: Putting Microsoft Works to Work, by Douglas Cobb, ISBN 1-55615-176-4. 411 pp with two 5.25in floppy discs.

Price: £29.95

Supplier: Penguin Books, 27 Wrights Lane, London W8 5TZ.

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the data you need to work through the examples given.

It would be hard to find fault with this book. Not only are the individual sections done well, but there's also a steady progression from the relatively simple material at the beginning to the more advanced topics presented towards the end.

If you really want to understand how Lotus 1-2-3 can help you with your business problems, you should find this book very useful indeed.

Product: Business Decision Making with 1-2-3, by Mark S. Albion and Edward J. Hope. ISBN 0-13-094194-8. 379 pp with two 5.25in discs.
Price: £20.23

Supplier: International Book Distributors Ltd., 66 Wood Lane, Hemel Hempstead, Herts, HP2 4RG.

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# Brief words on Word

PETER Rinearson is the author of the best-selling Word Processing Power with Microsoft Word and Microsoft Word Style Sheets. In this much shorter handbook, he gives a brief account of all the Word commands in alphabetical order, ranging from Adding Numbers to Zooming Windows.

Most of the entries are quite brief. For example, the description of saving a document takes up only about 16 lines — but enough detail is included to enable even a newcomer to carry out quite complex

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operations. Nothing important seems to have been left out but, despite the alphabetic structure, it isn't always easy to find what you want.

This is partly the fault of the way Microsoft Word is put together. Like many other programs, it's cursed with a whole bevy of awkward terms such as glossary, library and division, which mean almost nothing to the newcomer.

As an example, if you want to use the Dos shell – to format a disc, rename a file or carry out some other Dos function you first have to select the Library option. From the submenu which appears, you then have to choose the Run command. It all makes sense once you're used to it, but it isn't exactly intuitive.

Let's suppose that you want to find out from the book how to enter the Dos shell. Unfortunately there is no entry under either shell or library - you have to look under Dos.

Despite this criticism, this pocket-sized book should prove a useful companion to

Word, but it's no substitute either for the manual or for the author's other books.

- Product: Microsoft Word for the IBM PC, by Peter Rinearson. ISBN 1-55615-154-3. 122 pp.
- Price: £4.95
  - Supplier: Penguin Books Ltd., 27 Wrights Lane, London W8 5T2
    - Tel: 01-938 2200

# **Borland** bites back

QUATTRO is Borland's answer to 1-2-3, and even the name suggests that it goes one further than the Lotus product. In view of the excellence of Borland's original documentation, you might wonder what hasn't been said before that Stephen Cobb has found to write about.

The answer is that this is no mere begin-

ners' quide. The first chapter deals with advanced spreadsheet commands, and after that things get more complicated! Just about everything you could possibly want to know about Quattro has been dealt with in depth. For instance, there are 10 pages on logical functions alone and nearly 20 pages on text and string entry.

Everything is well illustrated and the book has been produced to a high standard. All the same, I do wonder about the price. I've complained before about the tendency of some companies to set UK prices by replacing \$ with £ and leaving the number untouched. This book goes one better - in the States it sells for just \$22.95.

- Product: Quattro Power User's Guide. by Stephen Cobb. ISBN 0-07-881367-0. 624 pp.
- Price: £24.95
  - Supplier: McGraw-Hill Book Co (UK) Ltd., McGraw-Hill House, Shoppenhangers Road, Maidenhead, Berks SL6 ZQL
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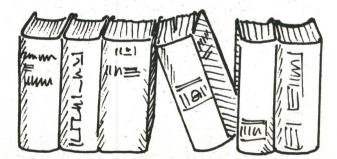
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IF you buy capital equipment for £c, it stays on your books as an asset until you get rid of it. However, it has long been realised that its value declines — or depreciates — over its life time until it reaches some fixed scrap or salvage value.

For example, if you buy a PC1640 for £499, after the first year it is probably only worth £300. In fact it is probably only worth that amount immediately after its box has been opened! After the second year it might only be worth £200 and so on until the only value left is the gold plating and scrap metal — say £5.

Depreciation is an easy idea to understand but not so easy to apply in practice. To know how much an asset is worth is a matter of judgment — and in some cases, great skill.

For this reason it isn't sensible to try to arrive at a considered estimate for every capital asset on a company's books — it would take too long and be far too wasteful of time. A much better solution is to apply a standard formula for how much something depreciates each year.

In this way the formula can be applied without any real knowledge of the nature of the capital item. Using a standard depreciation method also has the advantage that your local tax office isn't likely to come back and question your opinion.

#### In double decline

Most, but not all spreadsheets, supply a number of functions to enable you to calculate depreciation in a recognised fashion. The most simple of these is the @SLN or Straight Line depreciation function. To use it, all you need to specify is the initial cost of the capital asset, the final salvage value and the life of the asset.

The function @SLN(cost,salvage,life) will return the amount that the asset depreciates by each unit of time. For example, if you bought something for £15,000 and its life expectancy was 10 years with a final salvage value of £3,000 then @SLN(15000,3000,10) will return its annual decrease in value, £1,200.

In other words £1,200 should be subtracted from the asset's value every year. After 10 years depreciation you will find that the value of the asset is indeed the salvage value specified.

The @SLN function works by making the assumption that the value of the asset decreases smoothly from its purchase price to its salvage value. If your spreadsheet doesn't have an @SLN function, you can work out the same thing using:

@SLN(cost,salvage,life)= life

The @SLN function is simple, but for

# GOING DOWN?

In the fourth and final part of his series on making the most of a spreadsheet's financial functions, Mike James delves into the mysterious subject of depreciation

many items of capital equipment it doesn't represent reality. Our earlier example of the depreciation of an Amstrad PC1640 is a prime case.

Computer equipment tends to lose value much more quickly in the early days of its life. Methods of calculating depreciation taking this sort of behaviour into account are usually called accelerated depreciation.

Most spreadsheets provide two functions for accelerated depreciation — @SYD and @DDB. The Sum-of-Years Digits function, @SYD calculates the depreciation for an asset for any given period in its life.

Notice that as the depreciation isn't evenly spread there is a different value for each period. The function @SYD(cost,salvage,life,period) will return the depreciation for the specified period. For example, if you have bought a machine for £15,000 with a life of 10 years and a salvage value

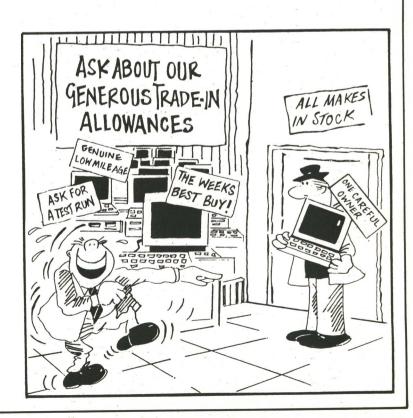
of £3,000, the @SYD method gives the following depreciation schedule:

Year	Depreciation	
1	2,181	
2	1,963	
3	1,745	
4	1,527	
5	1,309	
6	1,090	
7	872	
8	654	
9	436	
10	218	

and in general the depreciation for year p is @SYD(15000,3000,10,p).

The @SYD function produces a smooth quadratic decline in the value of an asset. If

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your spreadsheet doesn't have @SYD, you can use the equivalent formula:

a little embarrassed about reaching the salvage value a bit early so it sometimes generates negative depreciation to bring

(cost-salvage)\*(life-period+1) @SYD(cost,salvage,life,period)= (life\*(life+1)/2)

but as you can see, @SYD is simpler.

The @DDB or Double Declining Balance function produces an even faster decline in the value of an asset in the early years. The function @DDB(cost,salvage,life,period) returns the depreciation for an asset for the specified period in its life. Using the @DDB function instead of @SYD in the previous example gives:

Year	Depreciation
1	3,000
2	2,400
3	1,920
4 .	1,536
5	1,228
6	983
7	786
8	629
9	503
10	. 0

Notice how much larger the depreciation is in the early years and also notice that it is possible for @DDB to reach the salvage value before the lifetime of the asset. In this case the function should return a depreciation of zero for subsequent years - year 10 in this case.

If your spreadsheet doesn't have @DDB, you can use:

the final value back to the salvage value.

The three methods of calculating depreciation correspond to a linear, quadratic and exponential decay of value over time. It is interesting to compare these by way of a table or preferably a graph. If you type in the spreadsheet shown in Figure I you will be able to compare the three depreciation schemes for any cost, salvage value or life time.

To create the table, enter the cost, salvage and life details in A1.B3 as shown and the labels in A6.D6. Next enter 0 to 10 in A7.A16. The rest of the table consists of formulae. Enter +B1 into B7.D7. To calculate the current value using @SLN depreciation enter the formula:

#### +B7-@SLN(\$B\$1,\$B\$2,\$B\$3)

into B8 then copy it down the column B9.B16. To calculate the current value using @SYD depreciation enter the formula:

#### +C7-@SYD(\$B\$1,\$B\$2,\$B\$3,A8)

into C8 and copy it down the column C9.C16. Finally, to calculate the current value using @DDB depreciation enter the formula:

#### +D7-@DDB(\$B\$1,\$B\$2,\$B\$3,A8)

into D9.D16.

If your spreadsheet has graphics - most do these days - you can extend the example to produce a graph like that shown in Figure II. You can see quite clearly from this why the @SLN method is called straight line depreciation and that the @DDB method really does decrease the value of the asset quickly early in its life.

If your spreadsheet gives different values for the @DDB function to the ones listed in Figure II don't worry, you probably haven't made a mistake if the differences are confined to the final few

The reason for this is that there is no standard method of dealing with what happens if the value of the asset reaches its salvage value before the end of its life. You can see from the graph that in this case the @DDB value drops below the salvage value before the life of the asset is up, then stays constant.

What you actually record as the value of the asset, the salvage value or the lower depreciated value is up to you.

All three depreciation methods described in this article are rough and ready approximations to reality. Computer equipment almost certainly depreciates faster in its earlier years than even the @DDB method suggests.

Its lifetime is also very short – five years maximum – and its salvage value usually close to zero. Perhaps it's time to introduce a new financial function to calculate the depreciation of computer equipment. What about an @ODB(cost,age) function standing for Obsolete on the Day it was Bought and returning £cost/2 if age=1 and £5 for all other values of age?

@DDB(cost,salvage,life,period)	2*(current value at period-		at period-1)
		life	

Even if it does have @DDB, it is worth checking that it works exactly as described. For example, Quattro's version seems

	A	В	C	D
1	Cost=	15000		
2	Salvage=	3000		
3	Life=	10		
4				
5			J.	
6	Year	SLN value	SYD value	DDB value
7	0	15,000	15,000	15,000
8	1	13,800	12,818	12,000
9	2	12,600	10,855	9,600
9	3	11,400	9,109	7,680
10	4	10,200	7,582	6,144
11	5	9,000	6,273	4,915
12	6	7,800	5,182	3,932
13	7	6,600	4,309	3,146
14	8	5,400	3,655	2,517
15	9	4,200	3,218	2,013
16	10	3,000	3,000	2,013

Figure I: Depreciation spreadsheet

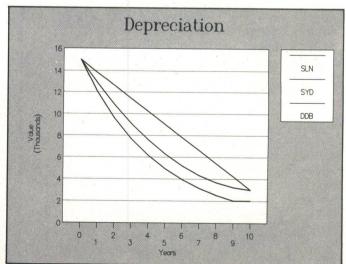
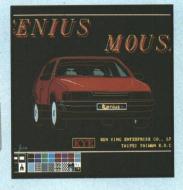


Figure II: A graph comparing @SLN, @SYD and @DDB depreciation.

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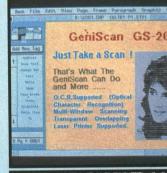




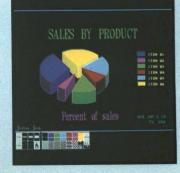
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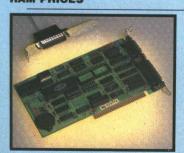


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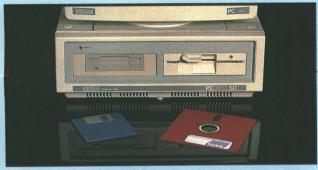


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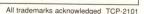
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### 1st Word Plus

Price: £79.95 Reviewed: March 1988 Electric Distribution, 8 The Green Street, Willingham, Cambs CB4 5VA.

Tel: 0954 61258

Works under the Gem environment. Includes a mail merger, spell checker and the facility to incorporate graphics. An easy program to learn, yet powerful and good value for money. Needs a mouse for best results. Good printer support.

### Gem Write

Price: £99.95 Reviewed: June 1987 Digital Research, Oxford House, Oxford Street, Newbury, Berks RG13 1JB. *Tel: 0635 35304* 

Works under the Gem environment. Easy to use. Limited range of type styles and graphics handling facilities. Supports other applications in the Gem family such as GemDraw and GemComm. No spell checker. Also needs a mouse for best results.

### K-Word 2

Price: £59.95

Reviewed: February 1988

Kuma Computers, Pangbourne, Berks.

Works under the Gem environment. Includes a spell checker and a simple mail merge option. Up to four documents can be open at a time. Has good printer configuration facilities. Fairly slow in operation. Good value for money for a Gem program.

### MindReader

Price: £7.99 (Reg. fee £36) Reviewed: March 1988 Shareware Marketing, 87 High Street, Tonbridge, Kent. *Tel: 0732 771344* 

A shareware program. Novel in that it tries to guess what word or phrase you are typing and offers you a selection to choose from. This facility can be extremely useful for people with physical handicaps because it cuts down on the amount of typing.

### Protext

Price: £59.95

Reviewed: January 1988

Arnor, Protext House, Wainman Road, Peterborough PE2 0BU. Tel: 0532 438301 Well tested on a wide variety of computers. Includes spell checker and dictionary utilities. Has a series of control codes which, in addition to setting document layout, allow the creation of form letters and facilitates mail merge. Two documents can be open at one time.

### Samna One Word

Price: £113.85

Reviewed: December 1987

Samna International, Southbank House, Black Prince Road, London SE1 7SJ. Tel: 01-587 1121 Wide range of printer drivers provided. Incorporates line-drawing facility. Has built-in scratchpad for notes not wanted in the main document. Printing is rather slow. Automatic backup at pre-determined intervals. Spell checker available for an extra £49.

### Sunword

Price: £195

Reviewed: September 1988

HB Marketing, Pier Road, North Feltham Trading Estate, Feltham, Middx TW14 OTT. Tel: 01-844 1202 Document names not restricted to eight letters — 35 maximum. Text and formatting data can be stored in glossaries. Calculator, mail merge and spell checker incorporated. Will work in columns, though no automatic snaking. Built-in comms program. Can handle background printing.

### Торсору

Price: £55

Reviewed: October 1987

Innova Software, 8 Gloucester Row, Wooton-under-Edge, Glos GL12 7DX. Tel: 0453 845153 Can be made memory resident. Ideal for owners of single floppy drive machines because the program disc isn't accessed after the initial startup. Includes basic mail merge facility. Full on-screen help available by single key press.

### WordPerfect 5.0

Price: £488.75

Reviewed: October 1988

Sentinel, First Floor, Wellington House, New Zealand Avenue, Walton-on-Thames, Surrey KT12 1PY. Tel: 0932 231161 Fast in operation. Not easy to learn but worth persevering with. Good spelling checker. Built-in graphics facility includes a screen-grabber. Good macro facilities which include a pause for input function. Columnar printing allowed.

### WordStar 2000 Rel. 3

Price: £534.75 Reviewed: April 1988 MicroPro International, Haygarth House, 28/31 High Street, Wimbledon Village, London SW19 5BY. Tel: 01-879 1122 Doesn't use the original WordStar key commands. Supports more than 400 printers. Built-in comms program. Full on-screen help. Includes spell checker and thesaurus. Has many additional features such as a typewriter function and an outline program.

### WordStar 1512

Price: £69.95 Reviewed: May 1987 MicroPro International, Haygarth House, 28/31 High Street, Wimbledon Village, London SW19 5BY Tel: 01-879 1122 Menu-driven. Doesn't use the original WordStar key commands. Needs a hard drive unless you don't mind a lot of disc swapping. Allows access to full MSdos character set. Includes mail merge and spell checker. Is easy to learn and aimed squarely at beginners.

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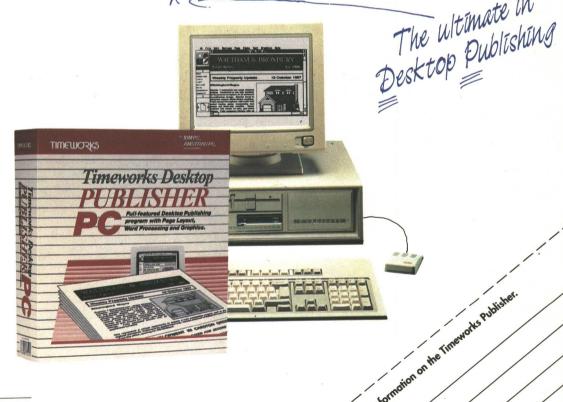
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Of course, if it's fast-action you're looking for, there's no substitute for using assembler, but with careful planning you can usually save a large amount of time-intensive programming by using C to produce over 90% of your program, and then tweek it with machine code.

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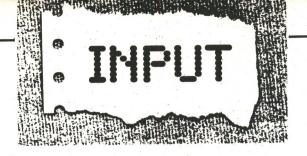
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## MAKING A CASE FOR COLOURFUL COMMANDS

EVER since I gave up on the aggravating, supposedly user friendly Wimp environment of Gem and Basic 2, I have been restricted to the equally aggravating standard four colours of CGA.

For months I had been baffled as to how the Amstrad 16 colour mode was obtained, then along comes the July issue of PC.

Included on the cover disc were MSdos-based programs which allowed the option of showing 16 colours — weather map and Deluxe Paint. If possible, could you please inform me of any Basic, C, Dos or Bios calls which will fulfil requirements? — R B Porter, Boyne Island, Queensland, Australla.

● 16 colour text is easy to obtain. Graphics are more involved and need a full article to explain — which will be published in the near future.

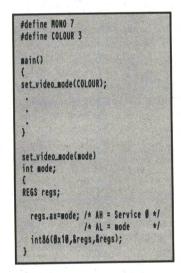
For text mode, when using GW Basic the command is COLOR foreground,back-ground,border where foreground is an integer between 0 and 15 while background and border are integers between 0 and 7. To use the full 16 colours you must first use the command SCREEN 0.

If you want a flashing foreground colour, add 16 to the normal colour code: COLOR 15,4,4 will give you high intensity white on a red background with red border while COLOR 31,4,4 will produce a flashing, high intensity white foreground with the same red background and border.

You can set your screen colours from Dos by running the Amstrad utility NVR or alternatively you can employ the Ansi control characters. Again, Ansi will be dealt with fully in a future article.

In C, the following code will

set the screen mode to 16 colour text. The code to set the attributes may vary between compilers so check your manual for the syntax:



For more information on the subject of video, see Rex Last's article on Page 22 of this issue.

a good start in terms of getting quick results with a reasonable level of power. Many PCs are supplied with GW Basic or BasicA which are MSdos-based and very reasonable implementations.

We'd guess from your letter that you have an Amstrad and having Basic 2 you can't run the programs from MSdos. Good implementations of Basic are Microsoft's QuickBasic and Borland's Turbo Basic which are both compilers — they generate code which is executable from the Dos prompt — for around £60.

Alternatively, study Ian Sharpe's C series. If the Ianguage looks comprehensible to you, as we said in a reply to another letter, Zortech C is excellent value at around £30, though C isn't as easy for the novice as Basic.

As for books, particularly with Basic you can learn a lot from reading the selection to be found on any library's shelves even if they're not PC specific. The new PC version of 30 Hour Basic from the National Extension College (ISBN 1 85356 008 1) is quite good, but books are a very personal thing. What one person finds to be the right approach can be wrong for another. Can any readers make recommen-

dations based on their experience?

### STARTING TO PROGRAM

HELPI I am in need of some sage and worldly advice. Having explored in some depth the joys of MSdos and all its batch-based mysteries, I would like to learn a programming language.

This I would tend to use for writing financial modelling programs — not games — and as a chartered engineer of many years standing I would prefer speedy elegance to plodding repetition.

Finally, the programs would have to run under MSdos, since that is what my business software runs on, and continually changing operating systems would be tedious. I should also add that although I have not

programmed in Basic, I once learned — and forgot — Algol and hence have a reasonable grasp of programming concepts.

So, learned friends, which language should I tackle, which book should I obtain and which

version of the recommended language (preferably cheap) should I buy? — M. W. J. Russell, Cromer.

 Although it's fashionable to knock Basic, for a relative beginner working alone it's still

This is YOUR own section of PC where we give you space for your own news and views, hints and tips, moans and groans – and even praise!

The address to write to is:

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### Cut down MS Works

THE biggest problem in using Microsoft Works integrated software – as bundled with the new Schneider Euro PC – is that the program disc has to be kept in the drive throughout operations. So, on a single drive machine, the size and number of new files are constrained by the remaining disc space.

The user manual recommends making several working discs containing the program

Turn to Page 115 ▶

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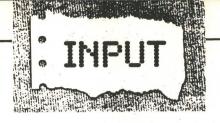
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### **◄ From Page 113**

and, as the file space becomes full, starting a new disc. If the macro utility MSKEY is installed, disc space becomes cramped to the point of uselessness.

The end result, if the user manual is followed, is a mass of 3.5in discs with not a lot on them apart from the program itself. The ideal answer, of course, is an external second drive with drive A for the program disc and drive B for data. However, there is another solution which is much less expensive.

The first step is to delete the various Help files once you have mastered Works and no longer need them. Next, you are only likely to need one printer driver — so delete any which you won't be using.

With MSkey, one printer driver and the spell checker installed, I have 105,472 bytes free for file storage. Without MSkey and the spell checker, it is possible to run Works with 160,186 free bytes. If you have a disc reserved for spreadsheets, you wouldn't need those two utilities so they could be removed without any inconvenience to yourself.

I have included an autoexec file which means I only need one start-of-day disc. My printer files — EPSON.PRD and EPSON.GPD — were extracted from the selection on printer file discs 1 and 2.

All this is fine, but what happens when you need help from Works? As you have deleted the necessary files from your start-of-day disc, this is not available to you. However, they are still on the Spell/help backup disc you made when

you first used the computer.

Press the Help button (F1) and the on-screen instructions will tell you to insert the Spell/Help disc. Once this is in your disc drive, all the help facilities are available to you. When you have finished with Help, press Cancel option and swap back to your original disc. — Alan Matsell, Grantham, Lincs.

 Thank you for those useful hints.

### **PICKING THE RIGHT C**

I AM writing to say that I enjoy reading PC and I always look forward to the free disc. I reckon myself to be an expert in most fields of the PC. Having ventured into Basic and Pascal I now want to buy a C package after reading the brilliant article — Beginning to C the Point — in your January issue.

I am considering buying Zortech C as it is cheap and seems to compile code quicker than Turbo C. Which should I buy? I am willing to spend up to £100. I am curious why Microsoft C is so expensive. Is it better than Turbo C and Zortech C, or are you just paying for the brand? I cannot run PC Boss from

the May 1988 disc on an AT,

but it runs properly on our Opus PCII.

When I loaded it on the AT the cursor wouldn't move and the computer locked up. When I tried to quit using Alt+F1, it displayed weird messages. Can you please help? — W. James, Littlebourne, Kent.

• It's hard to say that one C compiler is better than another. How do you judge it? The size and glossiness of the manuals? The number of extras such as debuggers and extended function libraries? The compactness and speed of the compiled code? The most expensive, cheapest or what?

Microsoft and Turbo C are

superb packages, but you'll find Zortech C hard to beat for value. It is used by software houses to compile commercial programs, so it is unlikely you'll ever find it limiting.

The manual may be printed on reconstituted egg boxes, but Zortech C is an economical introduction to the language which can be used for serious projects.

We tried PC Boss on two ATs here in the office and it ran perfectly. It is possible that your AT is not quite as compatible as it should be, or that there is something in the way it has been configured which upsets PC Boss. With so little to go on, it's impossible to diagnose.

### Search for an icon

TWO weeks ago I bought an Amstrad PC1640 DD/CM and have experienced a few problems. When I run Gem I can't get the icon for drive B to appear. I can access drive A and my ramdrive — C — but not B.

I have attempted to place the time and date into the battery-backed ram. When switching on after the system has been off for more than 30 minutes the time has reverted to 00:00:00 and the date to 1-01-80.

When I run the NVR program provided by Amstrad, on selecting Exit I have the option to save the alterations to NVR instead of saving to ram. I then enter the NVR and the bar moves down to Exit to Dos. When I select this option I am returned to the system prompt.

New batteries have been used for the ram. How can I get the system to recognise two drives and retain the time and date in memory? — Eric Hallam, Bridgwater, Somerset.

 To get the B drive icon on your desktop, highlight the icon for drive by clicking on it once. Next, pull down the Options menu and select *Install disc drive*.

Fill in the required drive letter – in your case B – and change the icon label if you want to. Finally, click on install and, when you return to desktop, the third icon will have appeared. To save going through this routine each time you run Gem, pull down the Options menu again and this time select Save Desktop.

As for your NVR problem, first check the batteries. You may be using new ones, but it only needs one of them to be faulty and the whole system fails.

NVR stands for Non-Volatile Ram – which is a small amount of random access memory powered from the four batteries under the monitor stand when the mains supply is switched off.

You do not need to run the NVR program to store the time and date. As long as you are using the version of MSdos 3.2 supplied by Amstrad, running the internal Dos commands TIME and DATE will automatically store the values in NVR.

If you are sure that each battery is in working condition, contact your dealer. As you have only had your system a few weeks it will still be covered by warranty.

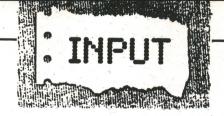
### Footwear for printers

HERE is a tip for a versatile telescopic printer stand which costs only £4.99. Buy a Leifheit shoe rack — I got mine from Argos — and cut the eight aluminium rods in half.

Fit eight of the larger diameter to the eight recesses moulded in one plastic side and eight smaller diameter to the other side. Tap the rods home securely and slide them into each other. The completed unit is sturdy, expandable and will take a lot of printer paper on the bottom rods.

Could you or your readers help me with the poor screen display of the Amstrad PPC portable, which I find gives me severe eyestrain? Amstrad cannot help and say they have had very few complaints about

Turn to Page 116 ▶



### ◆ From Page 115

the screen. They can't be seriousl Lights directed on to the screen cause reflections and are not an answer.

How much better it would have been if a paper-white or silvered LCD had been used instead of sickly green. Perhaps somebody has found a solution to the problem, or maybe it would be possible to change the green screen or illuminate it internally.

I would be most grateful for any advice and thank you for your excellent publication. I can recommend the Vine Micros PPC TV adapter when a TV is available. - P.J. McGowan, East Malling, Kent.

 We agree that the PPC screen leaves much to be desired. Illuminating it internally isn't a practical proposition and we haven't come across a source of replacement LCD units - perhaps this could be an opening for an enterprising manufacturer.

Has anyone anything more positive to offer?

### **Pounds for**

I REFER to your reader's problem in obtaining the £ sign while using Mini Office Professional. A clue lies on page six of the manual - run KEYBUK at the A> prompt before typing OFFICE. My AUTOEXEC.BAT file looks like this:

> ECHO OFF VERIFY ON KEYBUK OFFICE

Can you help me with a problem? I wish to install Header on drive B while using Mini Office Professional. I can get Header to run OK, but the

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output will only save on drive A and I wish to save it to a dedicated Header disc on drive B. - C.L. Greenhough, Diss, Norfolk.

 Thank you for those tips. To save a header file on drive B, all you need to do is enter the drive letter as the first part of the file name as follows:

### B:\<filename>

You can use any drive letter and directory combination which is legal for your system in place of B:\.

### Records on record

I HAVE a reasonably sized collection of records - more than 400 - and quite a few CDS

Can you suggest a program I

could use to catalogue them?

I would like the program to be able to list all records and each track on each record with a cross reference. I also need a search facility and to be able to print out the lists.

I have an Amstrad PC1512 upgraded to 640k ram, twin floppy drives and a mono monitor. I am a complete novice, so the program will have to be straightforward to operate. -John Neal, Bowston, Kendle.

 One program which matches your requirements for an easyto-use database which will work on a twin-floppy machine is the one found in the Mini Office Personal integrated

You will be able to search multiple fields and so find any occurrence of the data you want to locate. For full details. see the advertisement on Page

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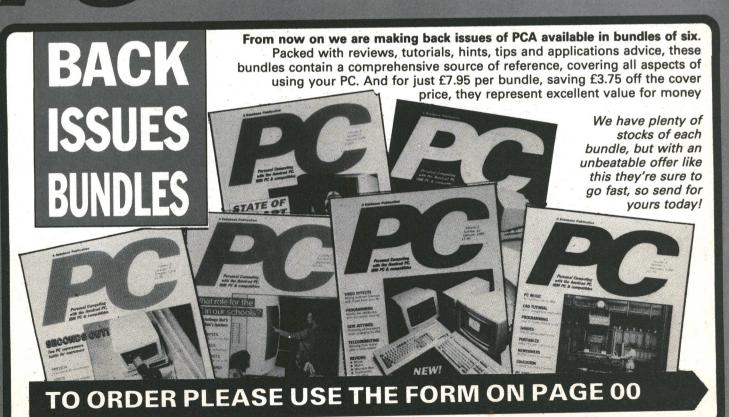
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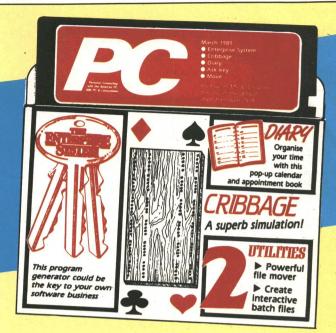
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# About your About your



### TO RUN YOUR FREE DISC

Boot up your machine with PCdos or MSdos, put the disc in drive A and type PCA.

### Enterprise System – Etcetera

Ever fancied setting up your own software business? Or perhaps you're already working in a commercial environment where you are spending a fortune on software, particularly if it's customised to your needs.

With the Enterprise System you can generate a variety of data-based programs, even if you know next to nothing about programming. Without spending years learning a language you can produce databases, stock control and invoice systems, plus many more applications — either individually or as integrated packages. The programs generated by the Enterprise System run under IBM, GW or a compatible Basic, and contrary to expectations run at an acceptable speed. If you require even more speed, the Basic could be compiled which would also prevent clients from tampering with it.

The demonstration — which is powerful enough to let you produce your own relational databases — was too large to fit on the disc along with the other programs, so it has been archived (compressed). Before you can run it, it needs to be reconstituted on to a blank disc. You will find an option to automatically do this within the PCA disc menu system, and all you need to do if you don't have a hard disc is provide two formatted discs.

One will store the demonstration, the other the sample application it generates. If you try to run the demo from one 360k floppy you will eventually get an error message. Put COMMAND.COM on the demo disc, and if you intend producing and running the sample application you will need Basic there too. Of course, hard disc owners need only select the un-archive to drive C option.

The introductory text file on the disc contains preliminary instructions, and you may like to take a printed copy by pressing Control+P before it is displayed on the screen. There is additional information within the program itself.

### Cribbage – Ology

This is a cut-down, but very playable, version of Ology's computerised card game classic. In case you haven't played Cribbage before there's a summary of the rules before you start play. There are mono and colour options but be warned – the PC is a gimlet-eyed meanie!

### Submit! Submit!

We're always happy to evaluate submissions for possible inclusion on future discs, and programs used will be paid for. Here are some guidelines which will improve your chances of success:

- Programs should preferably be stand-alone. There are several versions of Basic about and a program which relies on the reader having a particular one is likely to have a limited audience. We take this into account when judging a program's suitability.
- Don't duplicate programs which have appeared on our or other magazine's discs. Readers don't want the same thing twice unless there has been a vast improvement.
- Try to keep your file sizes down. A 100k program is a lot less less likely to be accepted than one of 20k because it would restrict what else we could fit on the disc.
- We look for programs with broad appeal which are easy to use. So before spending a lot of time on a submission, ask yourself who is going to want to use it and make as professional and user-friendly a job of it as you can.
- Please test your work thoroughly as bugs will more often than not result in rejection.
- Include full documentation as a plain Ascii file on the disc.
- Make sure that everything you send us is marked with your name, address and daytime telephone (if possible).
- Always send an sae if you want a reply and your submission returned.
- Please include a statement that the program is your own work, that we have your permission to use it, and it has not been submitted elsewhere.
- It varies from busy to mega-hectic round here, so don't worry if it's a few weeks before you hear anything.

### Diary – PC-Projects

With DIARY.COM installed – copy it into the root directory of your boot disc and put the command DIARY in your AUTOEXEC.BAT file – you will have a pop-up calendar and appointments book.

. Whether you're in an application or using MSdos, press Alt+F2 to see the calendar. Move from month to month with the cursor keys, and when you want to make a diary entry

Turn to Page 120 ▶

## About your

### **◄ From Page 119**

press Return. F1 flips between morning and afternoon, and there's a slot for each hour. Move the highlight bar down to the required time and type some text. Press Return, then F2 to save the day's file to disc. The diary is stored in the file APPOINT.DAT, which will be created when you first run the

If you find Diary useful, PC-Projects asks you to pay a small registration fee, in return for which you'll receive the Pascal source code, some free programs, and the firm's catalogue. Full details are displayed when Diary initialises.

### Move - David Foster

How many times have you copied a file from one disc or directory to another and then erased the original? Move combines the two operations and has some useful enhancements which take it beyond what could be achieved with a simple batch file. As usual, details are in the text file printed from the menu.

### Ask-key - by Barry Wood

Just over a year ago we gave away a suite of three programs which allowed you to tell which key the user had pressed in response to a batch file prompt. This is a very useful facility for creating interactive batch files where several options can be selected from a menu, or perhaps some optional course of action which needs a simple Y or N reply.

The trouble was that the programs amounted to some 45k,

which is a fair chunk of a 360k floppy's storage space. ASK KEY.COM is capable of performing the functions of any one of the original three programs, but weighs in at only 6k. Details of its use are given in the PCA menu and there's a demonstration batch file along with the C source code. You'll find Ask-key adds greatly to the potential applications – and the idiot-proofing - of batch files.

### Comments!

The free cover disc is one of the most popular parts of the magazine. Help us plan future editions by telling us what you think of this one. Were the demonstrations and utilities useful? Would you like to see more shareware like Diary? Do you enjoy the games? What would you like to see on future discs? Drop a line to the disc editor and have your say in the shape of things to come.

### Problems?

If you experience loading problems with your disc, it will be replaced free of charge. Send it with your name and address to:

Direct Disc Supplies Ltd.

Unit 19, Teddington Business Park

Station Road, Teddington, Middlesex TW11 9BO.

If you damage the disc yourself, include a cheque/PO for £1 — for postage and packing — made payable to Direct Disc Supplies Ltd.

If your disc has been damaged in transit, return it to PCA for replacement.

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Try out your skills as a card sharp with the computer version of Cribbage is probably one of the most popular card games, played in pubs and clubs all over the country. And now, for just £14.95 you can sharpen your skills by playing against the computer at levels ranging from beginner to expert. And if you are a beginner you can ask the program to give you hints, tips and advice while you're learning. Or if you're already an expert Crib player, you'll find this program will really give you a run for RRP £17.50 your money, and who

knows . . . maybe help you to earn a bob or two at the local card school!

**OVER** 

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THE DATABASE

Here are some of the glowing comments made by Paul Hendy in his review of PDQ in the November 1988 issue of PCA:

"PDQ is a very powerful relational database . . . makes efficient use of disc storage . . . has many useful features . . . installation of PDQ was straightforward . . . well designed . uses pull-down windows and pop-up menus to good effect, and the options have been laid out in a logical order . . . very impressive control over the display of records .. the filtering of records to match certain criteria is excellent ... I was very impressed by the options and facilities provided by PDQ, it is

Once you've started using your copy we're sure you'll agree with Paul Hendy that it is a remarkable piece of programming.

good value for money"

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You can put a spreadsheet slot in the middle of a word processed document or maintain a database using familiar word processor commands.

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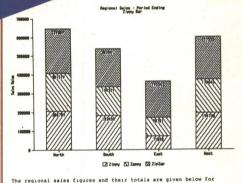
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### Spreadsheet data for Mr Zippy's report



Data fields in the word processed document



The regional sales figures and their totals are given below for reference:

Zippy Bar Zappy Bar ZipZap Bar 206789 201579 239809

Mr Zippy Confectionery Products Sales report for period ending 25-Jun-88

In this period the best results were achieved by the North region, which grossed sales of 648177.

The strongest selling line was the ZipZap bar which had total sales of 866565.

sales Of sbebe).

The results are illustrated by the pie chart which shows the regional variation in sales and the stacked bar chart which shows how the these sales totals are made up of the three product lines.

Comments:
The newly launched ZipZap bar has been heavily promoted which
more than the carry part of the week and it is hoped that sales
figures will improve in that area in the remainder of the month.

Example sales reports

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### 26

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### BINDER

Issue by issue PCA is growing into a detailed, comprehensive source of information that includes tutorials, reviews, hints and tips and, of course, the very popular cover discs.

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This disc contains some of the best public domain software to have crossed the Disc Editor's Desk.

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- List one year's information for the tax man (not CPC).
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"Surprisingly good performances, easy to set up and use." (PC User)

"A cinch to find data ... very flexible ... how little it takes to get started. At £68.94 it's something of a bargain." (Personal Computing with the Amstrad)

Those quotes are from reviews of our earlier PC version, with RAM-limited file car veity.

MASTERFILE PC is now even more powerful, and still growing - except for the price. If you want to know more, call us; our experts will be happy to discuss your filing needs.

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Data, 0-254 characters per field, 2000 per record

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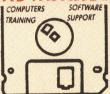
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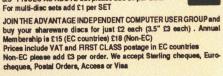
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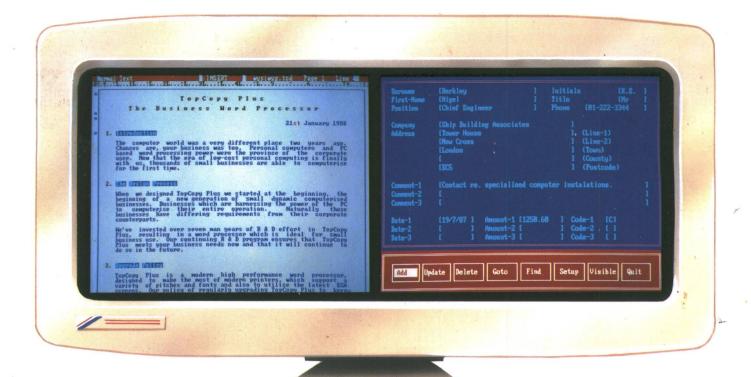
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